FLOOD INSURANCE STUDY

HUNTINGTON COUNTY, INDIANA
AND INCORPORATED AREAS

COMMUNITY NAME	COMMUNITY NUMBER
ANDREWS, TOWN OF	180097
HUNTINGTON COUNTY (unincorporated areas)	180438
HUNTINGTON, CITY OF	180094
MARKLE, TOWN OF	180457
MOUNT ETNA, TOWN OF	180461
ROANOKE, TOWN OF	180096
WARREN, TOWN OF	180095

Federal Emergency Management Agency

FLOOD INSURANCE STUDY NUMBER
18069CV000A

NOTICE TO FLOOD INSURANCE STUDY USERS

Communities participating in the National Flood Insurance Program have established repositories of flood hazard data for floodplain management and flood insurance purposes. This Flood Insurance Study (FIS) report may not contain all data available within the Community Map Repository. Please contact the Community Map Repository for any additional data.

The Federal Emergency Management Agency (FEMA) may revise and republish part or all of this FIS report at any time. In addition, FEMA may revise part of this FIS report by the Letter of Map Revision process, which does not involve republication or redistribution of the FIS report. Therefore, users should consult with community officials and check the Community Map Repository to obtain the most current FIS report components.

Selected Flood Insurance Rate Map panels for this community contain information that was previously shown separately on the corresponding Flood Boundary and Floodway Map panels (e.g., floodways, cross sections). In addition, former flood hazard zone designations have been changed as follows:

Old Zone:	New Zone:
A1 through A30	AE
B	X (shaded)
C	X

Initial Countywide FIS Effective Date:

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FLOOD INSURANCE STUDY
HUNTINGTON COUNTY, INDIANA AND INCORPORATED AREAS

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study (FIS) revises and supersedes the FIS reports and Flood Insurance Rate Maps (FIRMs) in the geographic area of Huntington County, Indiana, including the City of Huntington, the Towns of Andrews, Markle, Mount Etna, Roanoke, and Warren, and the unincorporated areas of Huntington County (hereinafter referred to collectively as Huntington County), and aids in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. This study has developed flood risk data for various areas of the community that will be used to establish actuarial flood insurance rates and to assist the community in its efforts to promote sound floodplain management. This information will also be used by Huntington County to update existing floodplain regulations as part of the Regular Phase of the National Flood Insurance Program (NFIP), and by local and regional planners to further promote sound land use and floodplain development. Minimum floodplain management requirements for participation in the National Flood Insurance Program (NFIP) are set forth in the Code of Federal Regulations at 44 CFR, 60.3.

In some states or communities, floodplain management criteria or regulations may exist that are more restrictive or comprehensive than the minimum Federal requirements. In such cases, the more restrictive criteria take precedence and the State (or other jurisdictional agency) will be able to explain them.

The Digital Flood Insurance Rate Map (DFIRM) and FIS report for this countywide study have been produced in digital format. Flood hazard information was converted to meet the Federal Emergency Management Agency (FEMA) DFIRM database specifications and Geographic Information System (GIS) format requirements. The flood hazard information was created and is provided in a digital format so that it can be incorporated into local GIS and be accessed more easily by the community.

1.2 Authority and Acknowledgments

The sources of authority for this Flood Insurance Study are the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

Information of the authority and acknowledgements for each of the new studies and previously printed FIS reports and Flood Insurance Rate Maps (FIRMs) for communities within Huntington County was compiled and is shown below:

Huntington County	The hydrologic and hydraulic analyses for this study were performed by Gannett, Fleming, Corddry, and Carpenter, Inc., for the FEMA, under Contract No. H-4804. This study was completed in June 1981.
Huntington, City of:	The hydrologic and hydraulic analyses for this study were performed by Gannett, Fleming, Corddry, and Carpenter, Inc., for the FEMA, under Contract No. H-4804. This study was completed in June 1981.
Andrews, Town of:	The hydrologic and hydraulic analyses for this study were performed by Gannett, Fleming, Corddry, and Carpenter, Inc., for the FEMA, under Contract No. H-4804. This study was completed in March 1981.
Roanoke, Town of:	The hydrologic and hydraulic analyses for this study were performed by Gannett, Fleming, Corddry, and Carpenter, Inc., of Harrisburg, Pennsylvania, for FEMA, under Contract No. H-4804. This study was completed in June 1981. All field surveys and aerial mapping were performed by Abrams Aerial Survey Corporation of Lansing, Michigan.
Warren, Town of:	The hydrologic and hydraulic analyses for this study were performed by Gannett, Fleming, Corddry, and Carpenter, Inc., for the FEMA, under Contract No. H-4804. This study was completed in June 1981.
New Studies:	The hydrologic and hydraulic analyses for approximate stream reaches of Huntington County were performed by Christopher B. Burke, Ltd., on behalf of the Indiana Department of Natural Resources, under Indiana Public Works Project Number E060018. The Indiana Department of Natural Resources managed the production of this study as part of their Cooperating

Technical Partner agreement with the Federal Emergency Management Agency dated April 29, 2004, which was defined by the Indiana DNR Mapping Activity Statement 08-06 dated July 7, 2008 and funded under agreement number EMC-2005-GR-7022.

Redelineation of the previously effective flood hazard information for this FIS report, correction to the North American Vertical Datum of 1988, and conversion of the unincorporated and incorporated areas of Huntington County into the Countywide format was performed by Christopher B. Burke, Ltd., on behalf of the Indiana Department of Natural Resources, under Indiana Public Works Project Number E060018. The Indiana Department of Natural Resources managed the production of this study as part of their Cooperating Technical Partner agreement with the Federal Emergency Management Agency dated April 29, 2004, which was defined by the Indiana DNR Mapping Activity Statement 08-06 dated July 7, 2008 and funded under agreement number EMC-2005-GR-7022.

1.3 Coordination

The purpose of an initial Consultation Coordinated Officer's (CCOs) meeting is to discuss the scope of the FIS. A final CCO meeting is held to review the results of the study. The dates of the initial and final CCO meetings held for the previously effective FIS reports covering the geographic area of Huntington County, Indiana are shown in Table 1 (References 1). The initial and final CCO meetings were attended by the study contractor, FEMA (or the Federal Insurance Administration), the Indiana Department of Natural Resources (IDNR), and the affected communities.

Table 1: CCO Meeting Dates for Pre-Countywide FIS

Community Name	Initial CCO Date	Final CCO Date
Andrews, Town of	May 1978 *	October 15, 1981
Huntington County (Unincorporated Areas)	May 1978 *	August 24, 1982
Huntington, City of	May 1978 *	August 24, 1982
Roanoke, Town of	May 1978 *	January 5, 1982
Warren, Town of	May 1978 *	October 15, 1981

* Day of Meeting Not Available

For this countywide FIS, an initial CCO meeting was held on September 11, 2007, and was attended by IDNR, the Huntington County SWCD, and the Huntington County Surveyor.

The results of the countywide study were reviewed at the final CCO meeting held on --, and attended by representatives of FEMA, IDNR and representatives from Huntington County. All problems raised at that meeting have been addressed.

2.0 AREA STUDIED

2.1 Scope of Study

This FIS covers the geographic area of Huntington County, Indiana, including the incorporated communities listed in Section 1.1

All FIRM panels for Huntington County have been revised, updated, and republished in countywide format as a part of this FIS. The FIRM panel index, provided as Exhibit 2, illustrates the revised FIRM panel layout.

Approximate methods of analysis were used to study those areas having a low development potential or minimal flood hazards as identified during the initial CCO meeting. For this study, ten new stream reaches were studied using approximate methods. The scope and methods of new approximate studies were proposed and agreed upon by FEMA, the IDNR, and Huntington County.

This FIS update also incorporates the determination of letters issued by FEMA resulting in map changes (Letters of Map Change, or LOMC's). No Letters of Map Revision (LOMR's) have been issued for Huntington County. Letters of Map Amendment (LOMA's) incorporated for this study are summarized in the Summary of Map Actions (SOMA) included with the Technical Support Data Notebook (TSDN) associated with this FIS update. Copies of the TSDN may be obtained from the Community Map Repository.

Table 2: Streams Previously Studied by Detailed Methods

Calf Creek	Cow Creek
Little River	Loon Creek
McPherren Ditch	Salamonie River
Wabash River	

Table 3: Streams Previously Studied by Approximate Methods

Bull Creek	Clear Creek
Elkenberry Ditch	Loon Creek
Majenica Creek	Nieman Creek
Rush Creek	Salamonie River
Silver Creek	Wearly Ditch

Table 4: Scope of Study

Flooding Source	Limits of Redelineation Study
Huntington Reservoir	Complete
Salamonie Reservoir	Wabash County Line to SR 124
Wabash River	SR 105 to SR 5

Flooding Source	Limits of Approximate Study
Bull Creek	US 24 to CR 1000N
Clear Creek	Wabash River to Whitley Co Line
Elkenberry Ditch	CR 200S to CR 500S
Loon Creek	Town of Andrews to CR 100E
Majenica Creek	SR 9 / 37 to CR 100E
Nieman Creek	Silver Creek to SR 105
Rush Creek	Logan Creek to CR 900 S
Salamonie River	SR 124 to CR 900 S

Table 4: Scope of Study

Flooding Source	Limits of Approximate Study
Silver Creek	US 24 to Wabash County Line
Wearly Ditch	Salamonie River Floodway to I-69

2.2 Community Description

Huntington County is located in north-central Indiana and is bordered by Whitley County to the north, Wells and Allen Counties to the east, Wells and Grant Counties to the south, and Wabash County to the west. Huntington County is located approximately 75 miles northeast of Indianapolis. The total land area contained within the county boundary is approximately 397 square miles. The City of Huntington, which is the county seat, is situated about 20 miles northwest of Bluffton, Indiana, 85 miles northeast of Indianapolis, and 23 miles southwest of Fort Wayne, Indiana. Huntington County is served by Interstate 69, US route 24, and State Routes 9, and 37.

The surface of Huntington County is ground and end moraines, resulting from glaciations during the Wisconsin Age, consisting of glacial till and stratified drift, whereas the immediate study reaches are alluvial plains consisting of water laid silt, sand, gravel, and some clay. Huntington County is located in the physiographic region known as the Tipton Till plain. This region includes most of the central part of the State of Indiana, extending from Ohio to Illinois and roughly bounded north to south by 41° and 39.5° north latitude.

The cumulative thickness of unconsolidated sand and gravel above bedrock for the majority of Huntington County varies from 0 to 20 feet, with the bedrock which underlies the area consisting primarily of limestone and dolomite of the Silurian Age, as a basement elevation of about 700 feet NAVD. In the southwestern section of the county, unconsolidated material is thicker varying normally from 20 to 40 feet with some areas being as much as 80 to 120 feet in thickness.

The Wabash River, the second largest tributary of the Ohio River, is one of the principal rivers of the State of Indiana. The Wabash River originates in Mercer County, Ohio, about 15 miles east of Fort Recovery and flows north and west to the Indiana-Ohio state line. From this point it flows generally northwesterly through the City of Bluffton to the City of Huntington where it begins to bend and flow in a westerly and southwesterly direction across Huntington County. The Wabash continues flowing in this direction across central Indiana to Warren County where it bends south and continues south forming the lower boundary between Illinois and Indiana to its confluence with the Ohio River about midway between Mt. Vernon,

Indiana and Shawneetown, Illinois. The Wabash River is a contributing basin to the Mississippi River and has a drainage area of 33,100 square miles.

The Little River is a tributary to the Wabash River originating on the west side of Fort Wayne and flowing southwesterly to its confluence with the Wabash River in the City of Huntington. The Little River has broad floodplains through most of the Huntington County with slow moving waters and a large amount of flood plain storage. The Little River has a total drainage area at its mouth of 288 square miles and an average slope of 1.3 feet per mile through the study reach in Huntington County.

Calf Creek is a small tributary to the Little River which originates in southern Jefferson Township and flows south and east to its confluence with the Little River about two miles north of the Town of Roanoke. Calf Creek falls 105 feet in its six miles of length and has a total drainage area of 10.5 square miles.

Cow Creek originates northwest of the Town of Roanoke and flows 5.5 miles south and east, through the southern section of town, to its confluence with the Little River immediately upstream of the County Road 900 North bridge over the Little River. Cow Creek falls 105 feet in this length and has a drainage area at its mouth of 8.51 square miles.

Loon Creek is a small tributary of the Wabash River which flows west and empties into the Wabash River about 1,700 feet downstream of State Road 105 just north of the Town of Andrews. Loon Creek's length of 15.1 miles extends from the center of Rock Creek Township in Huntington County, west through Andrews to the Wabash River. Loon Creek falls about 145 feet in this distance and has a drainage area of 21.5 square miles at its mouth.

McPherren Ditch, a tributary to Cow Creek, originates northwest of the Town of Roanoke and flows from northwest to southeast through the center of town. Through its length of 2.9 miles it falls 80 feet and drains 1.4 square miles at its mouth.

The Salamonie River flows northwest through the central section of the extraterritorial limits of the Town of Warren and empties into the Wabash River near Lagro in Wabash County. The Salamonie River extends from Salamonia near the Indiana-Ohio state boundary, northwest through Portland, Montpelier, and Warren to the Wabash River. The river falls about 350 feet in this distance and has a drainage area of 560 square miles at its mouth.

The topography of the area is nearly flat to gently rolling, and has gentle land slopes except near the Wabash and Little Rivers, where entrenchment of the river valleys is greatest. Huntington County has a range of local elevation from about 680 feet NAVD in the floodplains of the Wabash River, to over 900 feet NAVD in the southern section of the county.

Very little of the county has experienced urban development to date with farming being the major enterprise of the area. The densest development exists near the City of Huntington with sparse development near the settlements of Andrews, Markle, Mount Etna, Roanoke, and Warren.

The City of Huntington is located at the confluence of the Little River and the Wabash River and has a range of local elevations from about 700 feet NAVD in the floodplains of the Wabash River to over 820 feet NAVD in the northwestern corner of the city.

The Town of Andrews is located in western Huntington County. Local elevation ranges from about 705 NAVD in the northern part of town to nearly 780 feet NAVD in the southeastern corner.

The Town of Roanoke is located in the northeastern section of Huntington County within the Little River watershed. The ground surface is primarily ground moraine consisting of glacial till with the exceptions of the valleys around Cow Creek and McPherren Ditch, which are composed of outwash sediments consisting of sand, gravel, and clay. Elevation ranges from about 750 feet NAVD at the eastern edge of town to over 800 feet NAVD on the western and northern limits.

The Town of Warren is located adjacent to the Salamonie River Valley. The ground surface of the Salamonie River Valley is primarily ground moraine consisting of glacial till, running from northwest to southeast in an oblong shape. The local elevation is from about 795 feet NAVD in the northern section of the town to over 890 feet NAVD in the northeastern part of town.

The climate in Huntington County ranges from hot and humid in the summertime to cold during the winter season. Average daytime temperatures during the summer fall around 72.4 ºF, while winter temperatures average at approximately 27.2 ºF. Precipitation for Huntington County totals an annual amount of 37.16 inches.

According to U.S. Census Data from the year 2000, the population of Huntington County in 2005 was reported to be 37,570. Table 5 lists the population of the incorporated areas in Huntington County.

Table 5: Population of incorporated cities and towns in Huntington County (2000 Census)

Community	Population
Andrews, Town Of	1,255
Huntington, City Of	16,633
Markle, Town Of	654
Mount Etna, Town Of	105
Roanoke, Town Of	1,470
Warren, Town Of	1,323

2.3 Principal Flood Problems

Major flooding in Huntington County primarily occurs along the Little River, the Salamonie River, and the tributaries to those rivers. Major floods principally occur during the winter and spring months, but can occur during any season. Generally, two types of storm events cause flooding. During the winter and spring, storms of moderate intensity and long duration, coupled with frozen ground, cause flooding to occur. During the summer, thunderstorms which have high intensities and relatively short durations can cause floods. Localized flood problems in the incorporated areas are summarized below:

Andrews, Town of: A review of the records of the stream flow gages maintained by the U.S. Geological Survey in the Upper Wabash Basin indicates that the worse flooding has been experienced in February 1883, March 1904, March 1913, March 1925, January 1930, February 1936, May 1943, January 1950, April 1957, February, April and June of 1959, and April 1961 (Reference 3). The worst flood to be recorded occurred on March 26, 1913. Another major flood affecting Andrews was the flood of May 18, 1943.

Roanoke, Town of: Similar past history of flooding as Town of Andrews.

Warren, Town of: Major floods have been experienced on the Salamonie River during March 1913, May 1927, January 1930, February 1936, May 1943, January 1950, April and June 1957, June 1958, February and April 1959, and December 1966 (Reference 4). The discharges and frequencies of these floods on the Salamonie River at Roanoke are as follows:

Table 6: Flood Crest Elevations
USGS gage for Salamonie River near Warren

Year	Discharge Cubic Feet Per Second (CFS)	Elevation (feet, gage datum)
1958	11,300	16.13
1959	13,200	17.05
1978	11,400	16.21
1982	9,240	14.96
1985	10,800	15.35
1991	11,700	16.21
1998	13,500	16.82

Table 6: Flood Crest Elevations (cont.)
USGS gage for Salamonie River near Warren

Year	Discharge Cubic Feet Per Second (CFS)	Elevation (feet, gage datum)
1999	11,400	15.55
2003	10,400	14.96
2005	10,800	15.16

Huntington, City of: The significant flood damages in the City of Huntington occurred in 1904, 1913, 1930, 1937, 1943, and 1959 on the Wabash River and in 1950, 1952, 1955, 1959, and 1966 on the Little River. The discharges and flood elevations on these floods at the gaging stations on the Wabash River at Huntington and on the Little River just upstream of Huntington are as follows:

Table 7: Flood Crest Elevations
USGS gage for Wabash at Huntington

Year	Discharge Cubic Feet Per Second (CFS)	Elevation (feet, gage datum)
1955	9,220	18.05
1958	11,400	19.12
1959	14,900	23.20
1961	10,100	17.75
1963	9,120	16.72
1964	9,760	17.55
1985	6,020	***

***Not Provided for Stream Gage

Table 8: Flood Crest Elevations
USGS gage for Little River near Huntington

Year	Discharge Cubic Feet Per Second (CFS)	Elevation (feet, gage datum)
1950	5,990	16.90
1982	5,700	19.39
1985	5,750	19.50
1991	5,230	18.98
1996	5,130	18.75

2.4 Flood Protection Measures

In an attempt to reduce the flooding from the Wabash River, the U.S. Army Corps of Engineers began construction in 1963 on the Huntington dam. This flood control dam, which was completed in 1969, is located on the Wabash River about two miles south of the City of Huntington. The dam consists of a combination earthfill and concrete gravity section, 91 feet in maximum height and 6,500 feet long with a gated outflow and controlled sluiceways. During flood season, 149,000 acre-feet of storage is available for temporary retention of flood flows by the Huntington Reservoir which at full flood control pool has an area of 7,900 acres. It is estimated that in the first six years of operation, the project has prevented damages amounting to $5,257,000.

Also located within the county boundary lines of Huntington County is the upper reaches of the Salamonie Reservoir also completed by the U.S. Army Corps of Engineers in 1966. This reservoir provides no flood protection for Huntington County since the dam is located downstream on the Salamonie River about 15 miles north of Marion, IN.

Both lakes are operated for three purposes; as units with the Mississinewa Lake to reduce flood stages in the upper Wabash River Basin and with other lakes downstream in reduction of lower Wabash and Ohio River floods; to supplement low flows during drought conditions; and to provide recreational facilities (Reference 1).

Non-structural measures of flood protection are being utilized to aid in the prevention of future flood damage. These are in the form of land use regulations adopted from the code of Federal Regulations which control building within areas that have a high risk of flooding.

3.0 ENGINEERING METHODS

For the flooding sources studied by detailed methods in Huntington County, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this study. Flood events of a magnitude that are expected to be equaled or exceeded once on the average during any 10-, 50-, 100-, or 500-year period (recurrence interval) have been selected as having special significance for floodplain management and for flood insurance rates. These events, commonly termed the 10-, 50-, 100-, and 500-year floods, have a 10-, 2-, 1-, and 0.2-percent chance, respectively, of being equaled or exceeded during any year. Although the recurrence interval represents the long-term, average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood that equals or exceeds the 1-percent- annual-chance flood in any 50-year period is approximately 40 percent (4 in 10); for any 90-year period, the risk increases to approximately 60 percent (6 in 10). The analyses reported herein reflect flooding potentials based on conditions existing in the community at

the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish peak discharge-frequency relationships for each flooding source studied by detailed methods affecting Huntington County. Table 9 contains a summary of peak discharges for the 10-, 2-, 1-, and 0.2-percent annual chance floods, where applicable, for each flooding source studied in detail in Huntington County. Peak discharges in the table were compiled from previously effective FIS reports for Huntington County and incorporated areas.

Table 9. Summary of Discharges

Flooding Source And Location	Drainage Area (Square Miles)	Peak Discharge (cfs) 10% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
CALF CREEK					
State Highway Route 37	7.7	730	1,107	1,340	1,660
1100 North Road	7.3	725	1,150	1,310	1,630
COW CREEK					
Confluence with Little River	8.5	800	1,270	1,440	1,780
LITTLE RIVER					
Confluence with Wabash River	288	4,900	6,000	6,400	7,000
North Broadway Street	271	4,900	6,000	6,400	7,000
USGS Gage No. 3240 at 500 North Road Bridge Over Little River	263	4,700	5,700	6,100	6,650
Huntington-Allen County Boundary Line	50	2,110	2,600	2,750	2,900
LOON CREEK					
Norfolk and Western Railway Bridge	20.3	1,370	2,150	2,530	3,000
Upstream Limit	19.9	1,350	2,110	2,420	2,900
MCPHERREN DITCH					
Confluence with Cow Creek	1.4	260	400	460	600
SALAMONIE RIVER					
USGS Gage No. 03324300	425	10,900	14,800	16,000	18,300
900 South Road	415	10,700	14,500	15,900	18,200
Upstream of Warren's Extraterritorial Limits	401.5	10,500	14,300	15,800	18,100

Table 9. Summary of Discharges (cont.)

Flooding Source And Location	Drainage Area (Square Miles)	Peak Discharge (cfs) 10% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
WABASH RIVER					
State Highway Route 105	1,099	10,800	14,750	17,300	20,200
Downstream of Clear Creek	1,071	10,400	14,200	17,000	20,000
Downstream of Little River	1,011	9,800	13,300	16,000	19,000
Upstream of Little River	723	7,000	9,000	11,000	14,100
Huntington Dam	721	7,000	9,000	11,000	14,100

The equations used to determine the discharges in the majority of the cases are taken from Estimation of Peak Discharges of Indiana Streams by using log Pearson (iii) distribution. The equations presented in the report are also included in the latest version of the National Flood Frequency (NFF) program by the USGS, and are included in the USGS StreamStats application. In some cases, the discharges for a stream have been coordinated with the Indiana Department of Natural Resources, the Natural Resources Conservation Service (formally the Soil Conservation Service), the U.S. Geological Survey and the U.S. Army Corps of Engineers, through a Memorandum of Understanding dated May 6, 1976.

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of flooding from the sources studied were carried out to provide estimates of the elevations of floods of the selected recurrence intervals. Users should be aware that flood elevations shown on the Flood Insurance Rate Map (FIRM) represent rounded whole-foot elevations and may not exactly reflect the elevations shown on the Flood Profiles or in the Floodway Data table in the FIS report. Flood elevations shown on the FIRM are primarily intended for flood insurance rating purposes. For construction and/or floodplain management purposes, users are cautioned to us the flood elevation data presented in this FIS report in conjunction with the data shown on the FIRM.

Cross sections for the backwater analyses were obtained from a variety of sources including: physical survey data, USGS topographic mapping and local contour mapping. Precountywide study cross sections for Loon Creek, Salamonie River, Cow Creek, McPherren Ditch were obtained from aerial photography flown in April 1979 at a negative scale of 1:12,000. All bridges, dams and culverts were field surveyed. Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles (Exhibit 1). For stream segments for which a floodway was computed (Section 4.2), selected cross section locations are also shown on the FIRM.

Water-surface elevations for floods of the selected recurrence intervals were computed through use of the USACE HEC-2 step-backwater computer program. For the new approximate study reaches, the USACE HEC-RAS program was used. HEC-RAS is an updated version of the HEC-2 program used to perform step-backwater analyses.

Flood profiles were prepared for all streams studied by detailed methods and show computed water-surface elevations to an accuracy of 0.5 feet for floods of the selected recurrence intervals. For this countywide FIS, flood profiles have been consolidated into continuous stream reaches and adjusted to reflect the current vertical datum as described in Section 3.3.

Starting water surface elevations for the Salamonie River were derived from gage station data. Starting water surface elevations for the other detailed study were computed using slope-area method. At confluence points the water surface elevations were plotted from the stream with the highest controlling elevation. The estimated frequency levels for the Huntington Lake were provided by the Louisville District Corps of Engineers and correspond to elevation 789.6 ft NAVD88 for the 10% and 799.6 ft NAVD88 for the 2%, 1%, and 0.2% flood event.

Channel and overbank roughness factors (Manning's "n" values) used in the hydraulic computations were chosen by engineering judgment and were based on field observations of the stream and floodplain areas with the aid of "n" value tables and equations. Channel and overbank roughness factors used in the detailed studies are summarized by stream in Table 10.

Table 10. Channel and Overbank Roughness Factors

	Roughness Coefficients	
Stream	Main Channel	Overbanks
Calf Creek	0.035 – 0.045	0.050 – 0.090
Cow Creek	0.032 – 0.045	0.035 – 0.060
Little River	0.030 – 0.045	0.040 – 0.086
Loon Creek	0.032 – 0.040	0.038 – 0.076
McPherren Ditch	0.030 – 0.045	0.045 – 0.065
Salamonie River	0.030 – 0.065	0.038 – 0.090
Wabash River	0.030 – 0.045	0.040 – 0.070

For new approximate study areas, analyses were based on field inspection and modeling of the stream reaches using simplified HEC-RAS models. Structural measurements or field surveying was not performed. Cross section geometry was derived from topographic mapping provided by the City of Huntington and from the 2005 statewide orthophotography project with a maximum spacing of 100 feet. Starting elevations were assumed to be normal depth.

The hydraulic analyses for this study were based on unobstructed flow. The flood elevations shown on the Flood Profiles (Exhibit 1) are thus considered valid only if hydraulic structures remain unobstructed, operate properly, and do not fail.

3.3 Vertical Datum

All FIS reports and FIRMs are referenced to a specific vertical datum. The vertical datum provides a starting point against which flood, ground, and structure elevations can be referenced and compared. Until recently, the standard vertical datum in use for newly created or revised FIS reports and FIRMs was the National Geodetic Vertical Datum of 1929 (NGVD29). With the finalization of the North American Vertical Datum of 1988 (NAVD88), many FIS reports and FIRMs are being prepared using NAVD88 as the referenced vertical datum.

All flood elevations shown in this FIS report and on the FIRM are referenced to NAVD88. Structure and ground elevations in the community must, therefore, be referenced to NAVD88. It is important to note that adjacent communities may be referenced to NGVD29. This may result in differences in Base Flood Elevations (BFEs) across the corporate limits between the communities.

In this revision, a vertical datum conversion of -0.44 feet was calculated at the centroid of the county and used to convert all elevations in Huntington county from NGVD29 to NAVD88 using the National Geologic Survey's VERTCON online utility (VERTCON, 2005).

(NGVD29 – 0.44 = NAVD88)

For more information on NAVD88, see the FEMA publication entitled Converting the National Flood Insurance Program to the North American Vertical Datum of 1988 (FEMA, June 1992), or contact the Vertical Network Branch, National Geodetic Survey, Coast and Geodetic Survey, National Oceanic and Atmospheric Administration, Rockville, Maryland 20910 (Internet address http://www.ngs.noaa.gov).

Temporary vertical monuments are often established during the preparation of a flood hazard analysis for the purpose of establishing local vertical control. Although these monuments are not shown on the FIRM, they may be found in the Technical Support Data Notebook associated with the FIS report and FIRM for this community. Interested individuals may contact FEMA to access these data.

The coordinate system used for the production of the digital FIRMs is the Transverse Mercator projection, Indiana State Plane coordinate system, East Zone, referenced to the North American Datum of 1983 and the GRS 1980 spheroid.

4.0 FLOODPLAIN MANAGEMENT APPLICATIONS

The NFIP encourages State and local governments to adopt sound floodplain management programs. Therefore, each FIS provides 1-percent-annual-chance flood elevations and delineations of the 1- and 0.2-percent-annual-chance floodplain boundaries and 1-percent-annual-chance floodway to assist communities in developing floodplain management measures. This information is presented on the FIRM and in many components of the FIS report, including Flood Profiles, and the Floodway Data table. Users should reference the data presented in the FIS report as well as additional information that may be available at the local map repository before making flood elevation and/or floodplain boundary determinations.

4.1 Floodplain Boundaries

To provide a national standard without regional discrimination, the 1-percent-annual-chance flood has been adopted by FEMA as the base flood for floodplain management purposes. The 0.2-percent-annual-chance flood is employed to indicate additional areas of flood risk in the community. For each stream studied by detailed methods, the 1- and 0.2-percent-annual-chance floodplain boundaries have been delineated using the flood elevations determined at each cross section. Between cross sections, the boundaries were interpolated using topographic mapping from the City of Huntington and from the 2005 statewide orthophotography flight.

The 1- and 0.2-percent-annual-chance floodplain boundaries are shown on the FIRM (Exhibit 2). On this map, the 1-percent-annual-chance floodplain boundary corresponds to the boundary of the areas of special flood hazards (Zones A, AE, V, and VE); and the 0.2-percent-annual-chance floodplain boundary corresponds to the boundary of areas of moderate flood hazards. In cases where the 1- and 0.2-percent-annual-chance floodplain boundaries are close together, only the 1-percent-annual-chance floodplain boundary has been shown. Small areas within the floodplain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data.

For the streams studied by approximate methods, only the 1-percent-annual chance floodplain boundary is shown on the FIRM (Exhibit 2).

4.2 Floodways

Encroachment on floodplains, such as structures and fill, reduces flood-carrying capacity, increases flood heights and velocities, and increases flood hazards in areas beyond the encroachment itself. One aspect of floodplain management involves balancing the economic gain from floodplain development against the resulting increase in flood hazard. For purposes of the NFIP, a floodway is used as a tool to

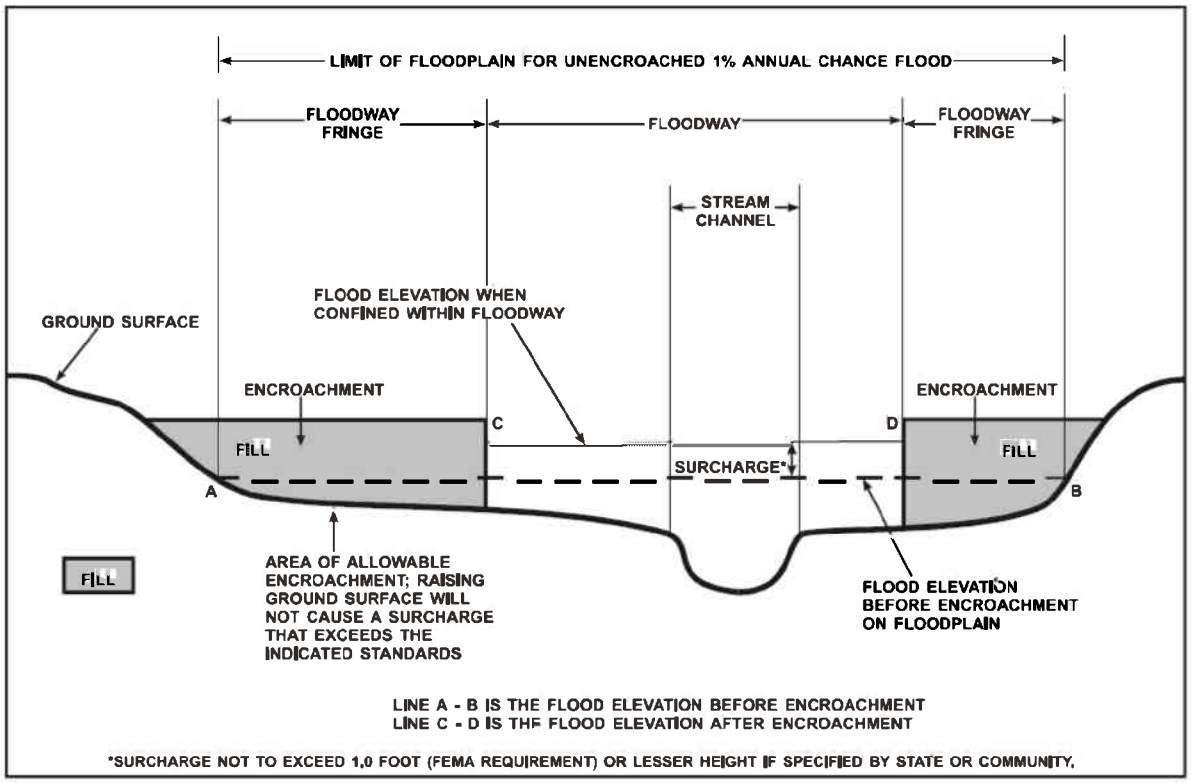
assist local communities in this aspect of floodplain management. Under this concept, the area of the 1-percent-annual-chance floodplain is divided into a floodway and a floodway fringe. The floodway is the channel of a stream, plus any adjacent floodplain areas, that must be kept free of encroachment so that the 1-percent-annual-chance flood can be carried without substantial increases in flood heights. Minimum Federal standards limit such increases to 1.0 foot, provided that hazardous velocities are not produced. The floodways in this study are presented to local agencies as minimum standards that can be adopted directly or that can be used as a basis for additional floodway studies.

The State of Indiana, however, per Indiana Code IC 14-28-1 and Indiana Administrative Code 312 IAC 10, has designated that encroachment in the floodplain is limited to that which will cause no significant increase in flood height. As a result, floodways for this study are delineated based on a flood surcharge of less than 0.15 feet. The floodways in this study were approved by the IDNR, and are presented to local agencies as minimum standards that can be adopted directly or that can be used as a basis for additional floodway studies.

The floodway presented in this FIS report and on the FIRM was computed for certain stream segments on the basis of equal conveyance reduction from each side of the floodplain. Floodway widths were computed at cross sections. Between cross sections, the floodway boundaries were interpolated. The results of the floodway computations have been tabulated for selected cross sections (Table 11). In cases where the floodway and 1-percent-annual-chance floodplain boundaries are either close together or collinear, only the floodway boundary has been shown.

The area between the floodway and 1-percent-annual-chance floodplain boundaries is termed the floodway fringe. The floodway fringe encompasses the portion of the floodplain that could be completely obstructed without increasing the water-surface elevation of the 1-percent-annual-chance flood more than 0.14 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to floodplain development are shown in Figure 2.

Figure 2: Floodway Schematic



FLOODING SOURCE		FLOODWAY			1 - PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FT/SEC)	REGULATORY (FEET, NAVD)	WITHOUT FLOODWAY (FEET, NAVD)	WITH FLOODWAY (FEET, NAVD)	INCREASE (FEET)
CALF CREEK								
A	2,840	95	377	3.6	754.8	754.8	754.8	0.0
B	3,190	66	229	5.8	755.7	755.7	755.7	0.0
C	3,430	286	824	1.6	757.4	757.4	757.4	0.0
D	4,320	89 †	248	5.3	758.3	758.3	758.4	0.1
E	5,320	55	268	4.9	760.9	760.9	761.0	0.1
F	5,570	54	289	4.5	762.4	762.4	762.4	0.0
COW CREEK								
A	200	100	394	3.7	752.4	752.4	752.4	0.0
B	495	32	191	7.5	752.9	752.9	752.9	0.0
C	705	41	220	6.5	753.8	753.8	753.8	0.0
D	1,040	62	292	4.9	755.1	755.1	755.1	0.0
E	1,200	142	553	2.6	756.1	756.1	756.2	0.1
F	1,415	258	840	1.7	756.2	756.2	756.3	0.1
G	1,870	170	357	4.0	756.5	756.5	756.5	0.0
H	2,215	70	295	4.9	757.0	757.0	757.1	0.1
I	2,880	55 †	242	6.0	758.7	758.7	758.7	0.0

[1] CALF CREEK - FEET ABOVE CONFLUENCE WITH LITTLE RIVER; COW CREEK - FEET ABOVE ROANOKE CORPORATE LIMITS

† FLOODWAY WIDTH MAY DIFFER FROM FIRM. PLEASE SEE FIRM FOR REGULATORY WIDTH.

TABLE 11

FEDERAL EMERGENCY MANAGEMENT AGENCY

HUNTINGTON COUNTY, IN AND INCORPORATED AREAS

FLOODWAY DATA

CALF CREEK - COW CREEK

FLOODING SOURCE		FLOODWAY			1 - PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FT/SEC)	REGULATORY (FEET, NAVD)	WITHOUT FLOODWAY (FEET, NAVD)	WITH FLOODWAY (FEET, NAVD)	INCREASE (FEET)
LITTLE RIVER								
A	1,760	484	1,854	3.5	706.3	706.3	706.4	0.1
B	3,170	407	1,614	4.0	708.0	708.0	708.1	0.1
C	4,090	172 †	873	7.3	709.8	709.8	709.9	0.1
D	4,610	224 †	1,099	5.8	711.3	711.3	711.4	0.1
E	5,670	149	1,084	5.9	713.0	713.0	713.0	0.0
F	6,340	333 †	1,847	3.5	713.9	713.9	713.9	0.0
G	8,240	456 †	1,615	4.0	715.6	715.6	715.6	0.0
H	9,200	167	942	6.8	716.8	716.8	716.8	0.0
I	10,380	173	1,080	5.9	718.6	718.6	718.6	0.0
J	10,500	168	1,065	6.0	719.1	719.1	719.1	0.0
K	11,540	168	1,103	5.8	720.5	720.5	720.5	0.0
L	12,200	259 †	930	6.9	721.3	721.3	721.3	0.0
M	12,720	152 †	1,257	5.1	725.9	725.9	725.9	0.0
N	13,450	165 †	1,375	4.7	726.5	726.5	726.5	0.0
O	14,250	211	1,651	3.9	726.9	726.9	726.9	0.0
P	14,370	213 †	1,663	3.8	727.1	727.1	727.1	0.0
Q	15,270	172	1,396	4.6	727.4	727.4	727.4	0.0
R	15,420	168 †	1,433	4.5	727.7	727.7	727.7	0.0
S	16,260	228	1,773	3.6	728.1	728.1	728.1	0.0
T	17,960	261	1,658	3.9	728.8	728.8	728.8	0.0
U	18,490	227	1,426	4.5	729.3	729.3	729.3	0.0
V	18,710	170	1,247	5.1	729.6	729.6	729.6	0.0
W	20,280	158	789	8.1	731.9	731.9	731.9	0.0
X	21,260	123	884	5.8	735.2	735.2	735.2	0.0
Y	22,320	148 †	1,106	6.2	737.0	737.0	737.0	0.0
Z	23,440	113 †	986	4.0	738.4	738.4	738.5	0.1
AA	24,100	179	1,531	5.2	739.4	739.4	739.4	0.0
AB	24,260	121	1,169	5.2	739.6	739.6	739.6	0.0
AC	25,250	107	1,181	5.2	740.6	740.6	740.6	0.0

[1] FEET ABOVE CONFLUENCE WITH WABASH RIVER

† FLOODWAY WIDTH MAY DIFFER FROM FIRM. PLEASE SEE FIRM FOR REGULATORY WIDTH.

TABLE 11

FEDERAL EMERGENCY MANAGEMENT AGENCY

HUNTINGTON COUNTY, IN AND INCORPORATED AREAS

FLOODWAY DATA

LITTLE RIVER

FLOODING SOURCE		FLOODWAY			1 - PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FT/SEC)	REGULATORY (FEET, NAVD)	WITHOUT FLOODWAY (FEET, NAVD)	WITH FLOODWAY (FEET, NAVD)	INCREASE (FEET)
LITTLE RIVER								
AD	26,540	140	1,445	4.2	741.8	741.8	741.9	0.1
AE	27,390	131	1,439	4.2	742.4	742.4	742.5	0.1
AF	28,830	107	1,418	4.3	743.2	743.2	743.3	0.1
AG	29,960	162	1,591	3.8	743.8	743.8	743.9	0.1
AH	31,030	221	2,291	2.7	744.4	744.4	744.5	0.1
AI	32,030	147 †	1,792	3.4	744.7	744.7	744.8	0.1
AJ	33,500	122 †	1,514	4.0	745.4	745.4	745.5	0.1
AK	34,710	686	3,768	1.6	746.0	746.0	746.1	0.1
AL	35,960	1064	4,828	1.3	746.2	746.2	746.3	0.1
AM	38,030	751	3,763	1.6	746.6	746.6	746.7	0.1
AN	39,560	436	3,183	1.9	746.9	746.9	747.0	0.1
AO	39,690	454	3,573	1.7	747.0	747.0	747.1	0.1
AP	42,300	1725	6,326	0.9	747.5	747.5	747.6	0.1
AQ	44,070	1965	7,101	0.8	748.1	748.1	748.2	0.1
AR	46,150	1505	6,422	0.9	748.7	748.7	748.8	0.1
AS	47,250	1400	5,614	1.0	749.1	749.1	749.2	0.1
AT	48,410	1245	5,903	1.0	749.2	749.2	749.3	0.1
AU	49,470	1160	6,238	0.9	749.4	749.4	749.5	0.1
AV	50,480	1100	5,442	1.1	749.7	749.7	749.8	0.1
AW	51,820	1015	5,590	1.0	750.0	750.0	750.0	0.0
AX	53,550	710	3,309	1.8	750.4	750.4	750.4	0.0
AY	56,830	787	4,832	1.2	751.4	751.4	751.4	0.0
AZ	56,950	769	4,434	1.3	751.5	751.5	751.5	0.0
BA	58,360	952	6,661	0.8	751.7	751.7	751.7	0.0
BB	59,820	1504	9,673	0.6	752.0	752.0	752.0	0.0
BC	62,170	2263	14,445	0.4	752.1	752.1	752.1	0.0
BD	65,510	1704	12,758	0.3	752.2	752.2	752.2	0.0

[1] FEET ABOVE CONFLUENCE WITH WABASH RIVER

† FLOODWAY WIDTH MAY DIFFER FROM FIRM. PLEASE SEE FIRM FOR REGULATORY WIDTH.

TABLE 11

FEDERAL EMERGENCY MANAGEMENT AGENCY

HUNTINGTON COUNTY, IN AND INCORPORATED AREAS

FLOODWAY DATA

LITTLE RIVER

FLOODING SOURCE		FLOODWAY			1 - PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FT/SEC)	REGULATORY (FEET, NAVD)	WITHOUT FLOODWAY (FEET, NAVD)	WITH FLOODWAY (FEET, NAVD)	INCREASE (FEET)
LITTLE RIVER								
BE	67,800	826	4,326	1.0	752.5	752.5	752.5	0.0
BF	69,770	1408	8,917	0.5	752.6	752.6	752.6	0.0
BG	71,100	1633 †	11,144	0.4	752.7	752.7	752.7	0.0
BH	72,570	1824	10,893	0.4	752.7	752.7	752.7	0.0
BI	74,360	1514 †	7,446	0.5	752.7	752.7	752.7	0.0
BJ	75,770	1336	6,837	0.6	752.8	752.8	752.8	0.0
BK	77,350	1176	7,168	0.4	752.8	752.8	752.8	0.0
BL	80,910	614	4,990	0.6	754.6	754.6	754.6	0.0
BM	82,250	771	5,052	0.5	754.6	754.6	754.6	0.0
LOON CREEK								
A	4,780	57 †	274	9.2	701.0	701.0	701.0	0.0
B	5,590	100	280	9.0	705.1	705.1	705.1	0.0
C	6,190	130 †	543	4.6	709.3	709.3	709.3	0.0
D	6,335	120 †	633	4.0	710.7	710.7	710.7	0.0
E	6,745	196	508	5.0	712.0	712.0	712.0	0.0
F	7,580	240	522	4.8	715.5	715.5	715.6	0.1
G	8,170	275 †	387	6.3	717.7	717.7	717.8	0.1
H	8,340	245 †	434	5.6	719.3	719.3	719.3	0.0
I	9,075	135	407	6.0	721.6	721.6	721.7	0.1
J	10,055	220	632	3.8	726.8	726.8	726.9	0.1

[1] LITTLE RIVER -FEET ABOVE CONFLUENCE WITH WABASH RIVER; LOON CREEK -FEET ABOVE CONFLUENCE WITH LITTLE RIVER

† FLOODWAY WIDTH MAY DIFFER FROM FIRM. PLEASE SEE FIRM FOR REGULATORY WIDTH.

TABLE 11

FEDERAL EMERGENCY MANAGEMENT AGENCY

HUNTINGTON COUNTY, IN AND INCORPORATED AREAS

FLOODWAY DATA

LITTLE RIVER - LOON CREEK

FLOODING SOURCE		FLOODWAY			1 - PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FT/SEC)	REGULATORY (FEET, NAVD)	WITHOUT FLOODWAY (FEET, NAVD)	WITH FLOODWAY (FEET, NAVD)	INCREASE (FEET)
MCPHERREN DITCH								
A	180	19	50	9.3	752.2	750.6 [2]	750.6	0.0
B	300	19	80	5.7	752.7	752.6 [2]	752.7	0.1
C	600	5 †	95	4.8	754.8	754.8	754.9	0.1
D	790	51	161	2.9	756.0	756.0	756.1	0.1
E	1,045	64	173	2.7	756.5	756.5	756.6	0.1
F	1,320	100	215	2.1	757.5	757.5	757.6	0.1
G	1,720	27	77	6.0	758.2	758.2	758.3	0.1
H	1,910	101	254	1.8	760.0	760.0	760.0	0.0
I	2,460	34	83	5.5	760.7	760.7	760.8	0.1
J	3,265	69	132	3.5	765.6	765.6	765.6	0.0
SALAMONIE RIVER								
A [3]	-90	560	4,642	3.4	805.1	805.1	805.2	0.1
B	60	760	5,783	2.8	805.3	805.3	805.4	0.1
C	1,275	803	6,136	2.6	805.9	805.9	806.0	0.1
D	2,510	702	5,662	2.8	806.7	806.7	806.8	0.1
E	3,795	639	4,841	3.3	807.8	807.8	807.9	0.1
F	4,930	704	5,012	3.2	808.5	808.5	808.6	0.1
G	5,810	880	6,689	2.4	809.0	809.0	809.1	0.1
H	6,715	893	6,308	2.5	809.2	809.2	809.3	0.1
I	7,850	680	7,520	2.1	809.6	809.6	809.7	0.1
J	7,960	660	6,968	2.3	810.4	810.4	810.5	0.1
K	8,575	770	6,949	2.3	810.9	810.9	811.0	0.1
L	9,925	1160	6,269	2.5	811.9	811.9	812.0	0.1
M	11,050	1358	11,814	1.3	812.2	812.2	812.3	0.1
N	12,875	1117	8,709	1.8	812.4	812.4	812.5	0.1
O	14,225	925	7,970	2.0	813.0	813.0	813.1	0.1

[1] MCPHERREN DITCH - FEET ABOVE ROANOKE CORPORATE LIMITS; SALAMONIE RIVER - FEET ABOVE COUNTY ROAD 900 SOUTH

[2] ELEVATIONS WITHOUT CONSIDERING BACKWATER FROM LITTLE RIVER

[3] CROSS SECTION A AND R ARE LOCATED BEYOND THE EXTRATERRITORIAL LIMITS

† FLOODWAY WIDTH MAY DIFFER FROM FIRM. PLEASE SEE FIRM FOR REGULATORY WIDTH.

TABLE 11

FEDERAL EMERGENCY MANAGEMENT AGENCY

HUNTINGTON COUNTY, IN AND INCORPORATED AREAS

FLOODWAY DATA

MCPHERREN DITCH - SALAMONIE RIVER

FLOODING SOURCE		FLOODWAY			1 - PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FT/SEC)	REGULATORY (FEET, NAVD)	WITHOUT FLOODWAY (FEET, NAVD)	WITH FLOODWAY (FEET, NAVD)	INCREASE (FEET)
SALAMONIE RIVER								
P	15,650	1030	8,474	1.9	814.0	814.0	814.1	0.1
Q	16,575	990	6,412	2.5	814.2	814.2	814.3	0.1
R[2]	17,865	1587 †	7,016	2.3	814.6	814.6	814.7	0.1
WABASH RIVER								
A	90	245 †	2,871	6.0	692.8	692.8	692.9	0.1
B	1,600	609 †	4,590	3.8	693.7	693.7	693.7	0.0
C	2,380	481	3,617	4.8	693.9	693.9	693.9	0.0
D	3,250	556	4,026	4.3	694.3	694.3	694.4	0.1
E	4,600	826	5,990	2.9	694.9	694.9	695.0	0.1
F	5,200	716	5,575	3.1	695.1	695.1	695.2	0.1
G	6,220	387 †	3,138	5.4	695.2	695.2	695.3	0.1
H	7,110	282 †	2,927	5.8	695.7	695.7	695.7	0.0
I	8,080	462 †	4,160	4.1	696.3	696.3	696.3	0.0
J	9,580	406	2,985	5.7	696.8	696.8	696.8	0.0
K	10,890	355 †	3,484	4.9	697.7	697.7	697.8	0.1
L	11,880	546	3,253	5.2	698.2	698.2	698.3	0.1
M	12,690	548	4,543	3.7	698.9	698.9	699.0	0.1
N	14,120	691	4,691	3.6	699.5	699.5	699.6	0.1
O	15,440	614	3,768	4.5	699.9	699.9	700.0	0.1
P	17,350	339	3,133	5.1	701.1	701.1	701.2	0.1
Q	18,260	236	2,449	6.5	701.5	701.5	701.6	0.1
R	19,310	258 †	2,733	5.9	702.4	702.4	702.5	0.1
S	20,330	414	3,788	4.2	703.2	703.2	703.2	0.0
T	21,750	670	3,506	4.6	704.0	704.0	704.1	0.1
U	22,730	318 †	2,681	6.0	704.7	704.7	704.8	0.1
V	23,040	319 †	2,713	5.9	705.0	705.0	705.1	0.1

[1] SALAMONIE RIVER - FEET ABOVE COUNTY ROAD 900 SOUTH ROAD; WABASH RIVER - FEET ABOVE STATE ROUTE 105

[2] CROSS SECTION A AND R ARE LOCATED BEYOND THE EXTRATERRITORIAL LIMITS

† FLOODWAY WIDTH MAY DIFFER FROM FIRM. PLEASE SEE FIRM FOR REGULATORY WIDTH.

TABLE 11

FEDERAL EMERGENCY MANAGEMENT AGENCY

HUNTINGTON COUNTY, IN AND INCORPORATED AREAS

FLOODWAY DATA

SALAMONIE RIVER - WABASH RIVER

FLOODING SOURCE		FLOODWAY			1 - PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FT/SEC)	REGULATORY (FEET, NAVD)	WITHOUT FLOODWAY (FEET, NAVD)	WITH FLOODWAY (FEET, NAVD)	INCREASE (FEET)
WABASH RIVER								
W	24,110	258	2,527	4.4	706.6	706.6	706.6	0.0
X	26,250	295	2,944	3.7	708.2	708.2	708.2	0.0
Y	27,250	305	2,914	3.8	709.5	709.5	709.5	0.0
Z	28,140	438	3,319	3.3	710.0	710.0	710.0	0.0
AA	29,220	202	2,251	4.9	710.7	710.7	710.7	0.0
AB	30,440	502 †	4,010	2.7	711.8	711.8	711.8	0.0
AC	31,700	649 †	4,569	2.4	712.4	712.4	712.5	0.1
AD	32,890	635	3,901	2.8	712.9	712.9	713.0	0.1
AE	33,630	213 †	2,101	5.2	713.5	713.5	713.6	0.1
AF	34,600	240	2,079	5.3	714.8	714.8	714.9	0.1
AG	35,640	308	2,568	4.3	716.0	716.0	716.0	0.0
AH	37,180	332	2,462	4.5	717.0	717.0	717.1	0.1
AI	38,460	743 †	4,533	2.4	717.8	717.8	717.8	0.0
AJ	39,240	429	3,516	3.1	719.7	719.7	719.7	0.0
AK	40,510	406 †	3,147	3.5	720.3	720.3	720.3	0.0
AL	41,750	205	2,654	4.1	720.9	720.9	720.9	0.0
AM	42,920	322	2,458	4.5	721.4	721.4	721.4	0.0
AN	43,910	265 †	2,651	4.1	722.2	722.2	722.3	0.1
AO	45,410	230	1,948	5.6	723.3	723.3	723.3	0.0
AP	46,740	677	4,311	2.6	724.6	724.6	724.7	0.1
AQ	47,970	391 †	3,231	3.4	725.0	725.0	725.1	0.1
AR	49,420	291	2,680	4.1	725.8	725.8	725.9	0.1
AS	50,310	284	2,280	4.8	726.5	726.5	726.6	0.1
AT	50,750	163 †	3,351	3.3	726.9	726.9	727.0	0.1

[1] FEET ABOVE STATE ROUTE 105

† FLOODWAY WIDTH MAY DIFFER FROM FIRM. PLEASE SEE FIRM FOR REGULATORY WIDTH.

TABLE 11

FEDERAL EMERGENCY MANAGEMENT AGENCY

HUNTINGTON COUNTY, IN AND INCORPORATED AREAS

FLOODWAY DATA

WABASH RIVER

5.0 INSURANCE APPLICATIONS

For flood insurance rating purposes, flood insurance zone designations are assigned to a community based on the results of the engineering analyses. These zones are as follows:

Zone A

Zone A is the flood insurance risk zone that corresponds to the 1-percent-annual-chance floodplains that are determined in the FIS by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no BFEs or base flood depths are shown within this zone.

Zone AE

Zone AE is the flood insurance risk zone that corresponds to the 1-percent-annual-chance floodplains that are determined in the FIS by detailed methods. In most instances, whole-foot BFEs derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone X

Zone X is the flood insurance risk zone that corresponds to areas outside the 0.2-percent-annual-chance floodplain, areas within the 0.2-percent-annual-chance floodplain, and areas of 1-percent-annual-chance flooding where average depths are less than 1 foot, areas of 1-percent-annual-chance flooding where the contributing drainage area is less than 1 square mile, and areas protected from the 1-percent-annual-chance flood by levees. No BFEs or base flood depths are shown within this zone.

6.0 FLOOD INSURANCE RATE MAP

The FIRM is designed for flood insurance and floodplain management applications.

For flood insurance applications, the map designates flood insurance risk zones as described in Section 5.0 and, in the 1-percent-annual-chance floodplains that were studied by detailed methods, shows selected whole-foot BFEs or average depths. Insurance agents use the zones and BFEs in conjunction with information on structures and their contents to assign premium rates for flood insurance policies.

For floodplain management applications, the map shows by tints, screens, and symbols, the 1- and 0.2-percent-annual-chance floodplains, floodways, and the locations of selected cross sections used in the hydraulic analyses and floodway computations.

The current FIRM presents flooding information for the entire geographic area of Huntington County. Previously, separate FIRMs were prepared for each identified flood prone incorporated community and for the unincorporated areas of the county. Historical data relating to the maps prepared for each community are presented in Table 12.

7.0 OTHER STUDIES

This FIS report either supersedes or is compatible with all previous studies on streams studied in this report and should be considered authoritative for purposes of the NFIP.

8.0 LOCATION OF DATA

Information concerning the pertinent data used in the preparation of this study can be obtained by contacting the Flood Insurance and Mitigation Division, Federal Emergency Management Agency, Region V, 536 S. Clark Street, 6th Floor, Chicago, IL 60605.

COMMUNITY NAME	INITIAL IDENTIFICATION	FLOOD HAZARD BOUNDARY MAP REVISIONS DATE	FIRM EFFECTIVE DATE	FIRM REVISIONS DATE
Andrews, Town of	April 2, 1976	March 11, 1977	September 30, 1982	None
Huntington County (Unincorporated Areas)	March 3, 1978	June 22, 1979	July 18, 1983	None
Huntington, City of	June 7, 1974	June 4, 1976	July 18, 1983	None
Markle, Town of	TBA	None	TBA	None
Mount Etna, Town of	TBA	None	TBA	None
Roanoke, Town of	December 28, 1973	July 23, 1976	December 1, 1982	None
Warren, Town of	November 23, 1973	April 30, 1976	September 30, 1982	None

TABLE 12

FEDERAL EMERGENCY MANAGEMENT AGENCY

HUNTINGTON COUNTY, IN AND INCORPORATED AREAS

COMMUNITY MAP HISTORY

9.0 BIBLIORAPHY AND REFERENCES

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5. Federal Emergency Management Agency, Flood Insurance Study, Town of Warren, Indiana, March 30, 1982.
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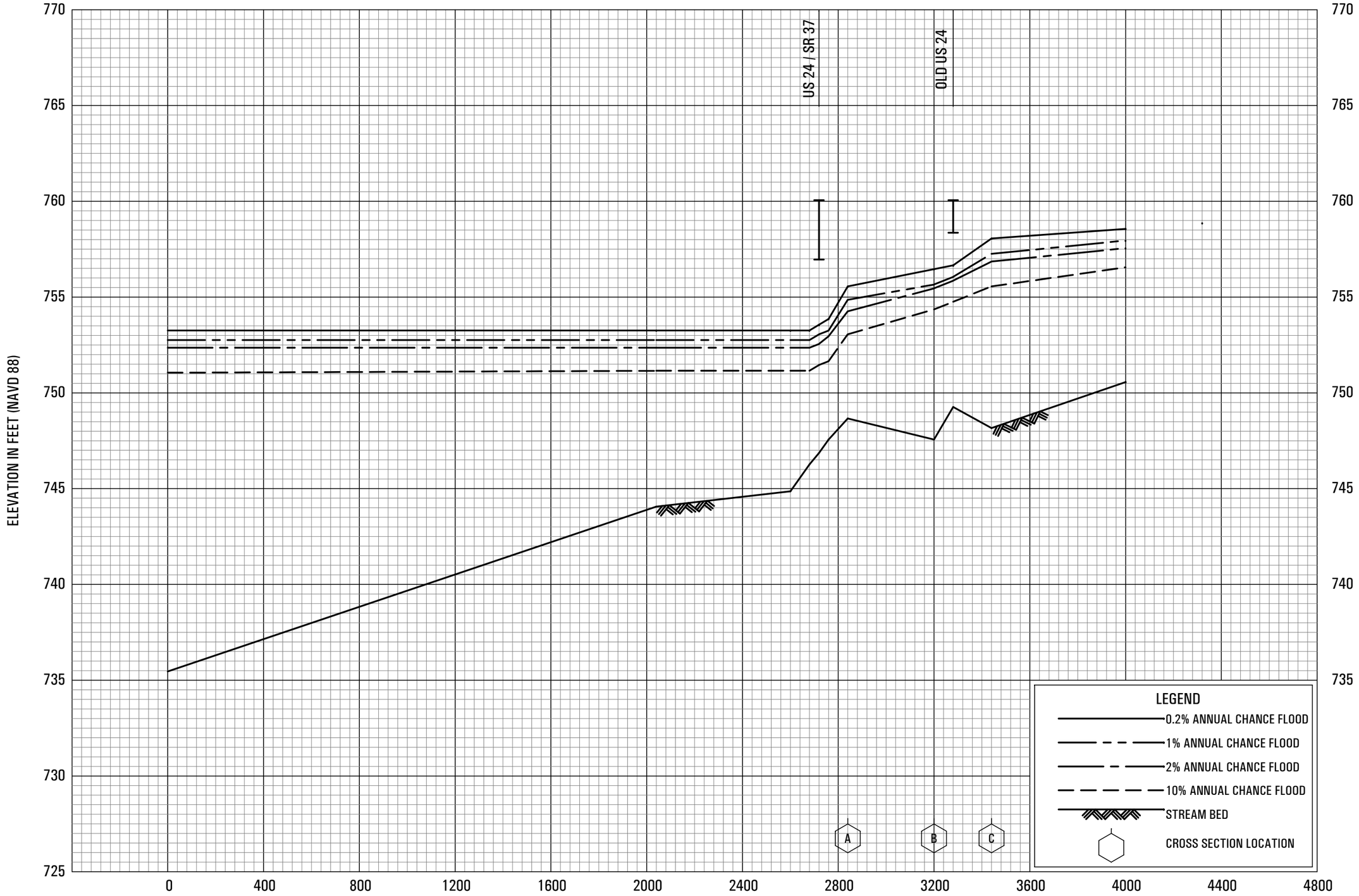


FLOOD PROFILES

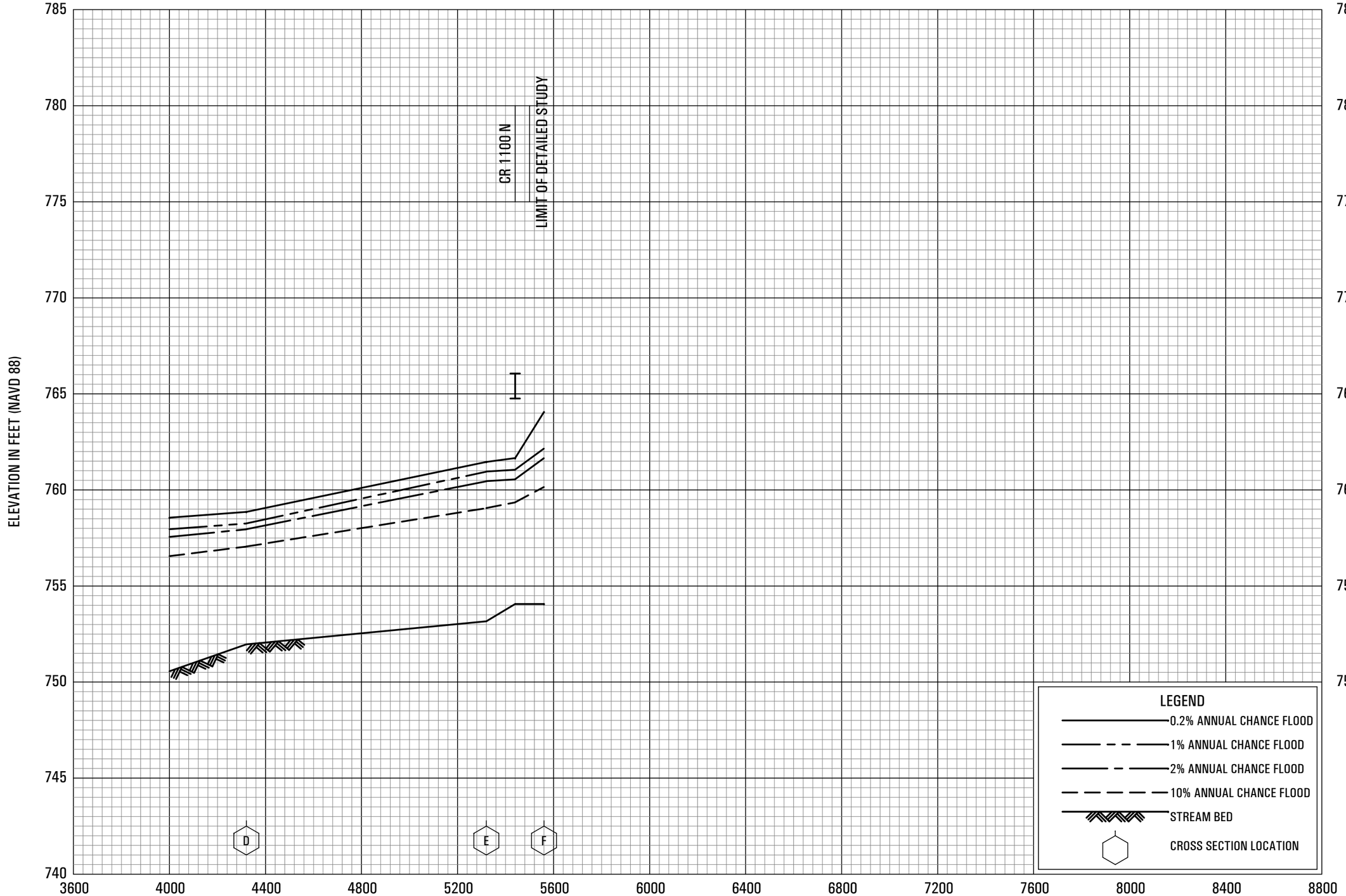
CALF CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

HUNTINGTON COUNTY, IN

AND INCORPORATED AREAS

01P



FLOOD PROFILES

CALF CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

HUNTINGTON COUNTY, IN

AND INCORPORATED AREAS

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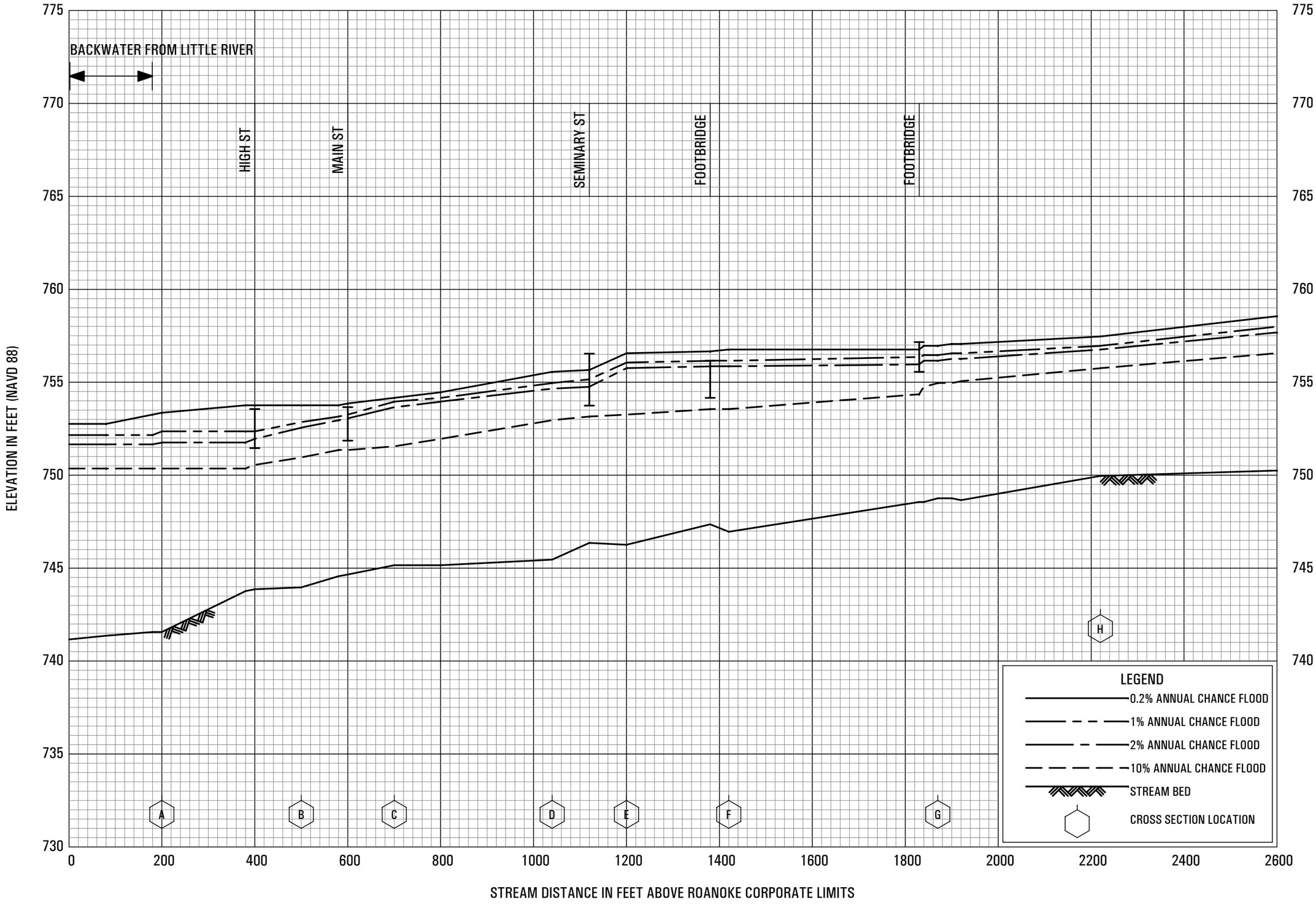


FLOOD PROFILES

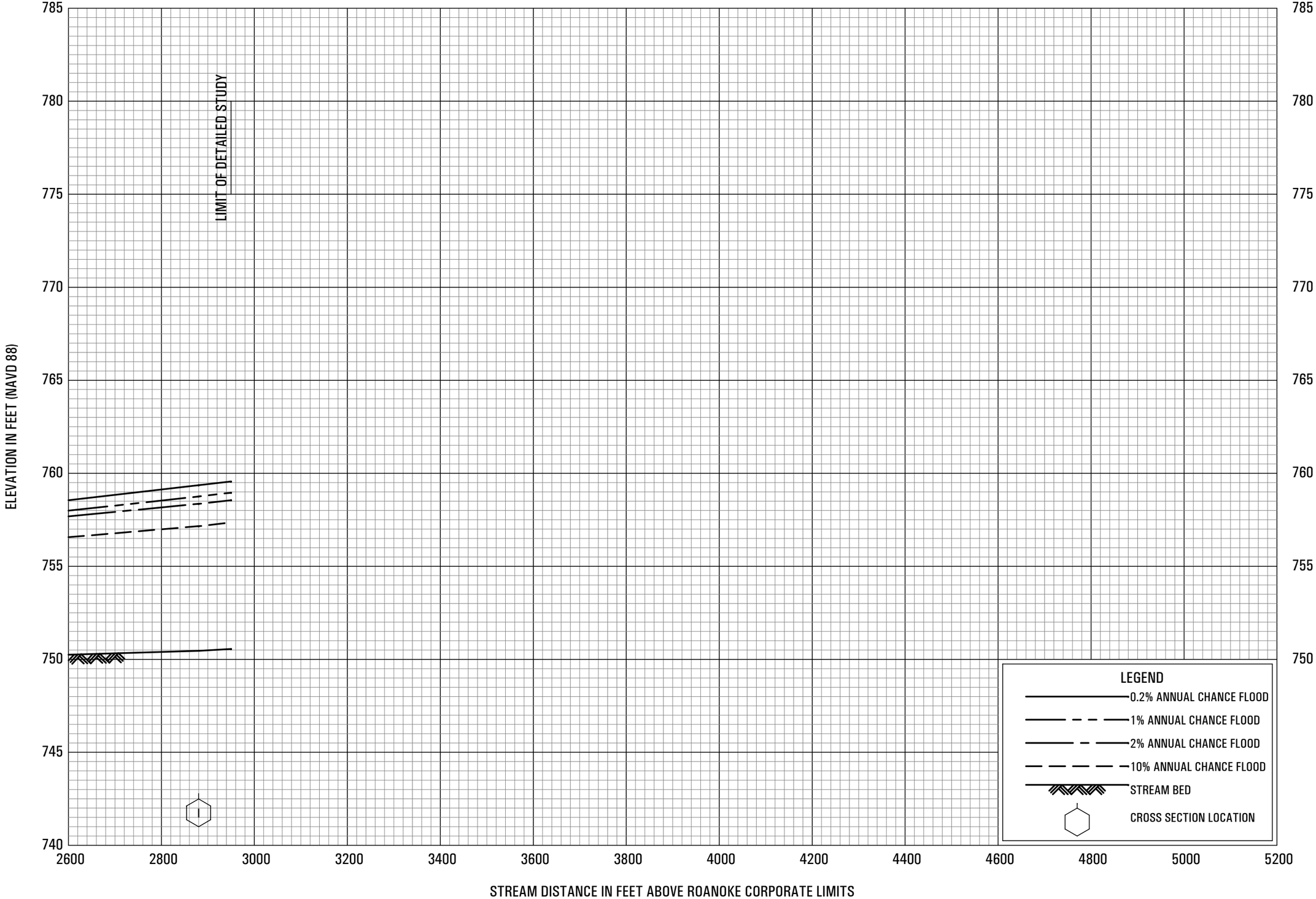
COW CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

HUNTINGTON COUNTY, IN

AND INCORPORATED AREAS

03P



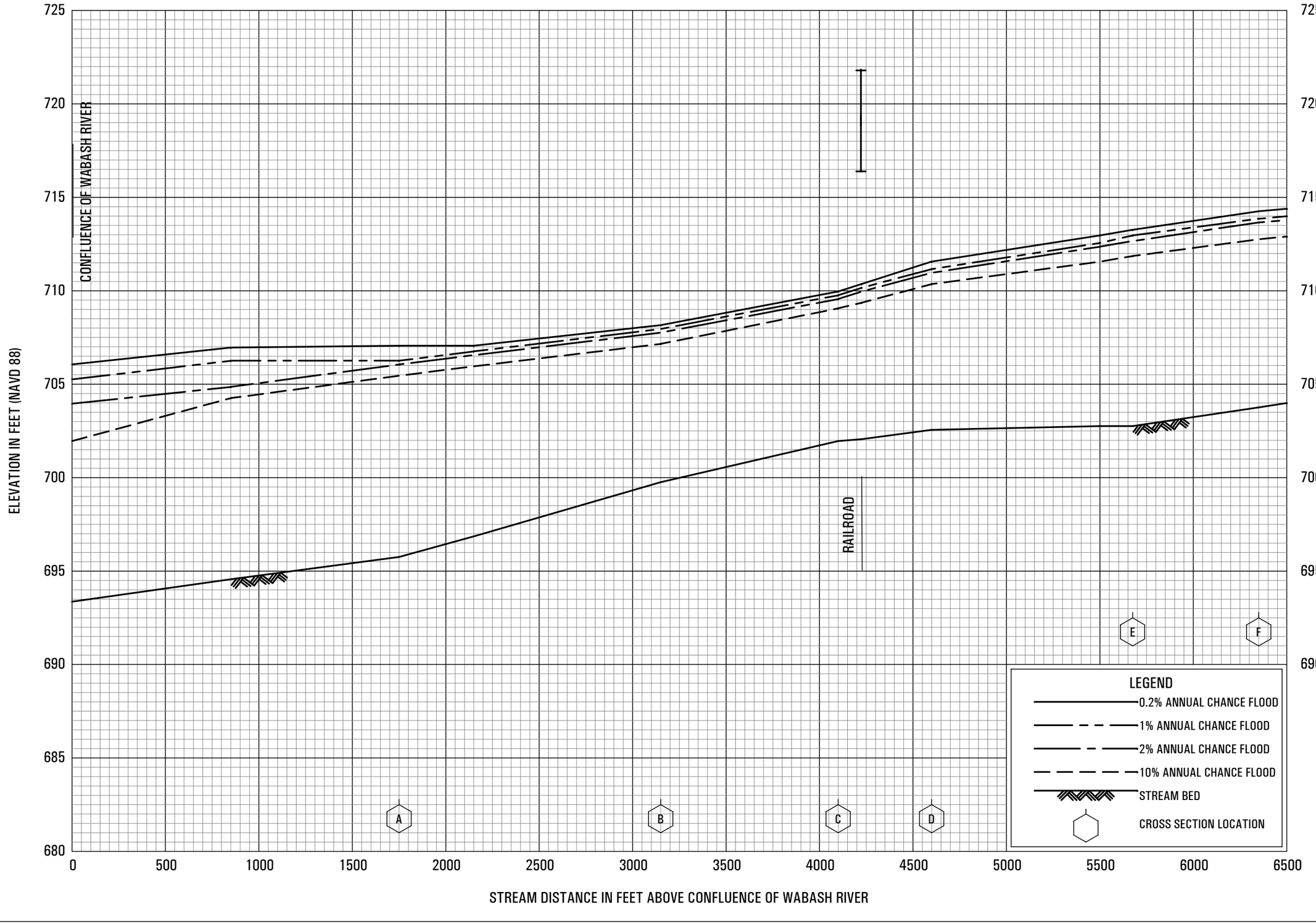
FLOOD PROFILES

COW CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

HUNTINGTON COUNTY, IN

AND INCORPORATED AREAS



FLOOD PROFILES

LITTLE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

HUNTINGTON COUNTY, IN

AND INCORPORATED AREAS

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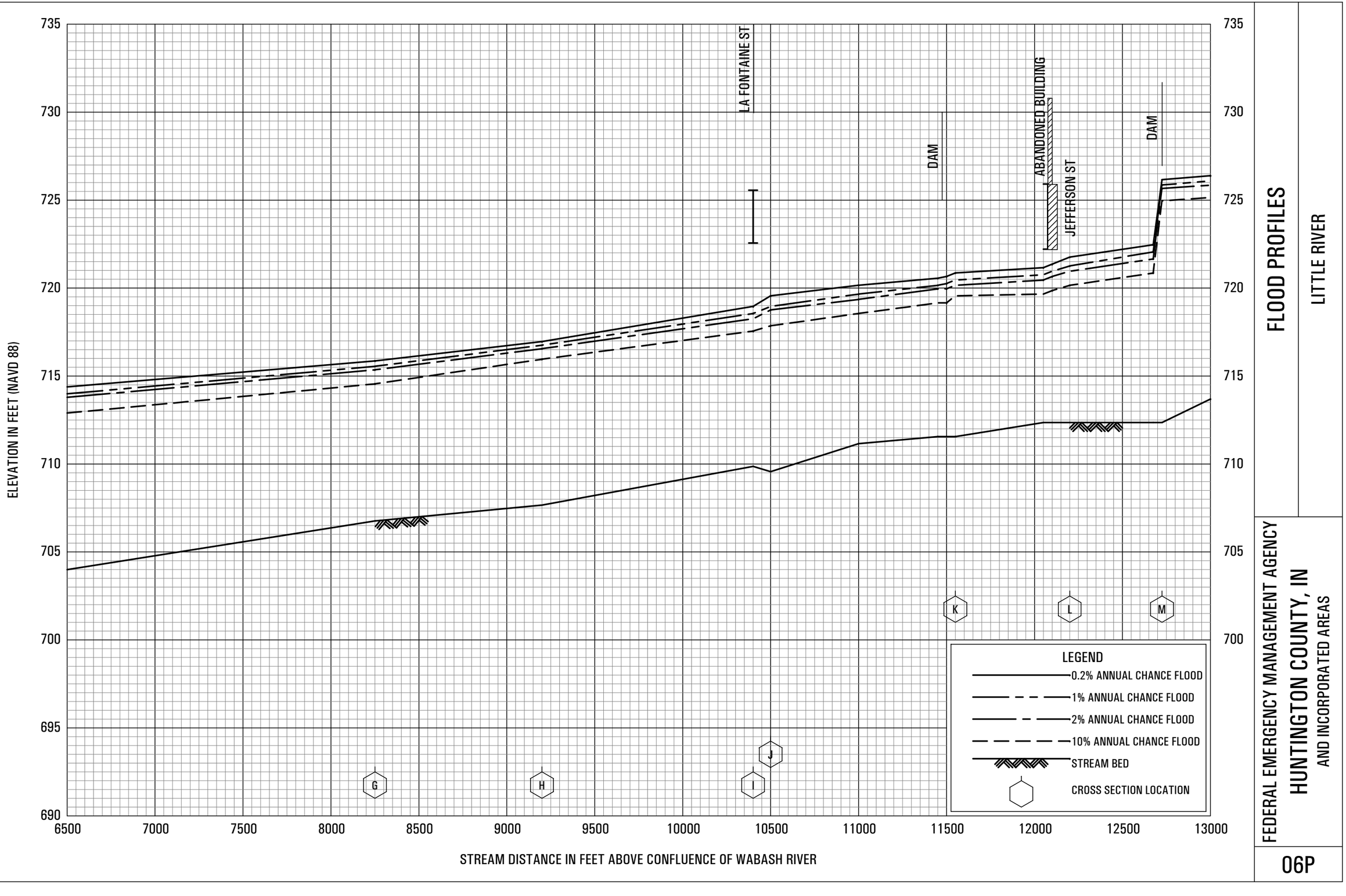

FLOOD PROFILES

LITTLE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

HUNTINGTON COUNTY, IN

AND INCORPORATED AREAS

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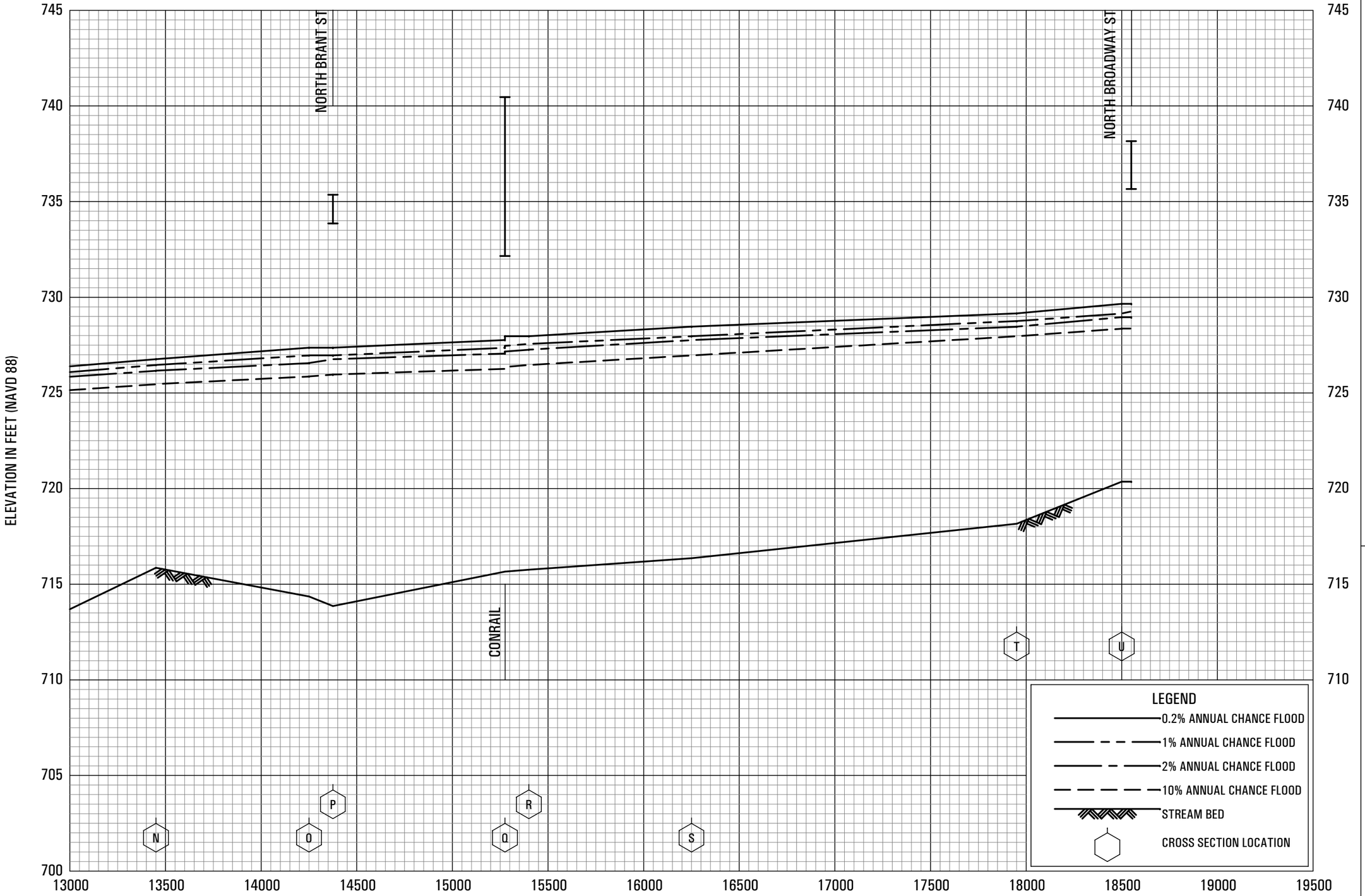

FLOOD PROFILES

LITTLE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

HUNTINGTON COUNTY, IN

AND INCORPORATED AREAS

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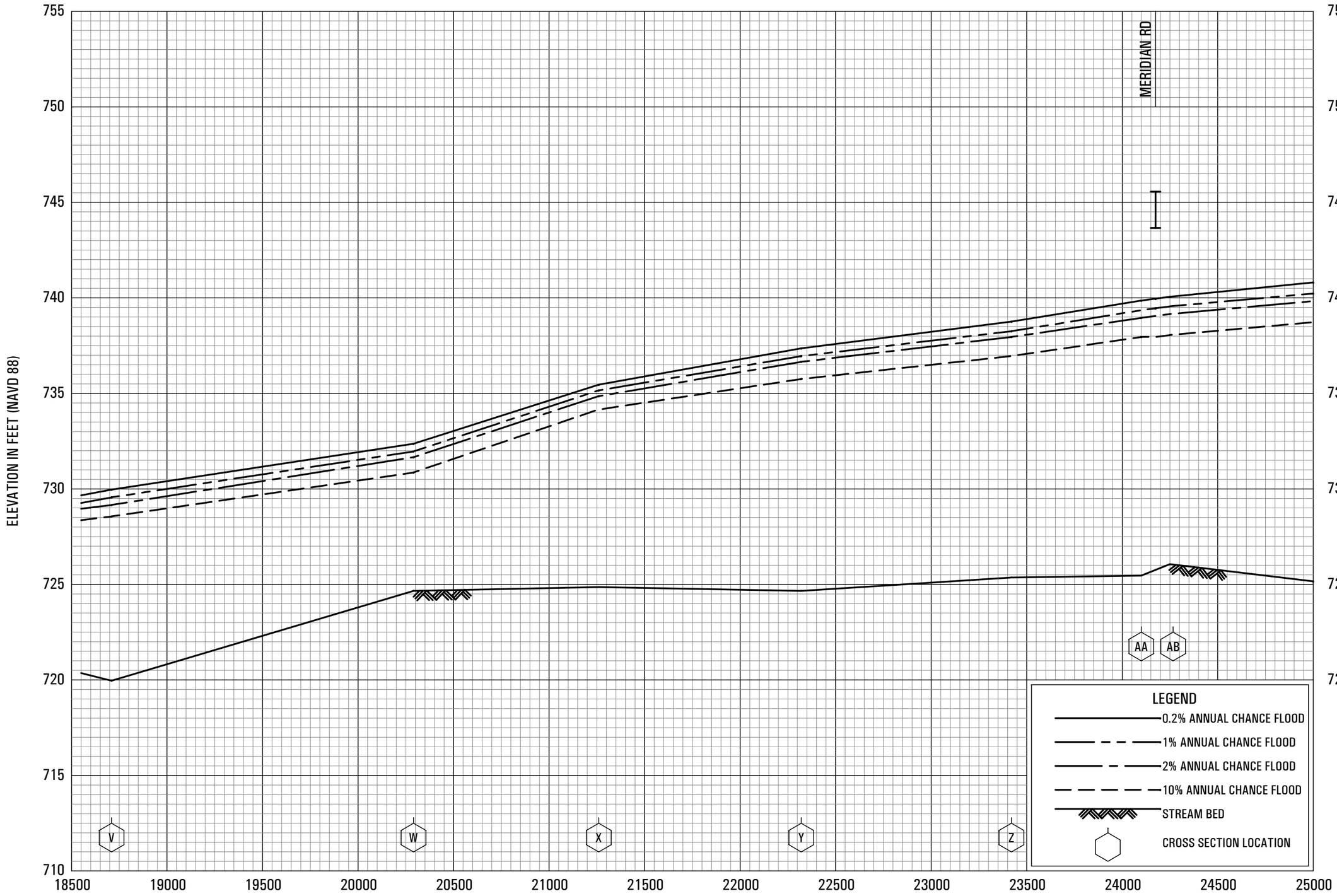


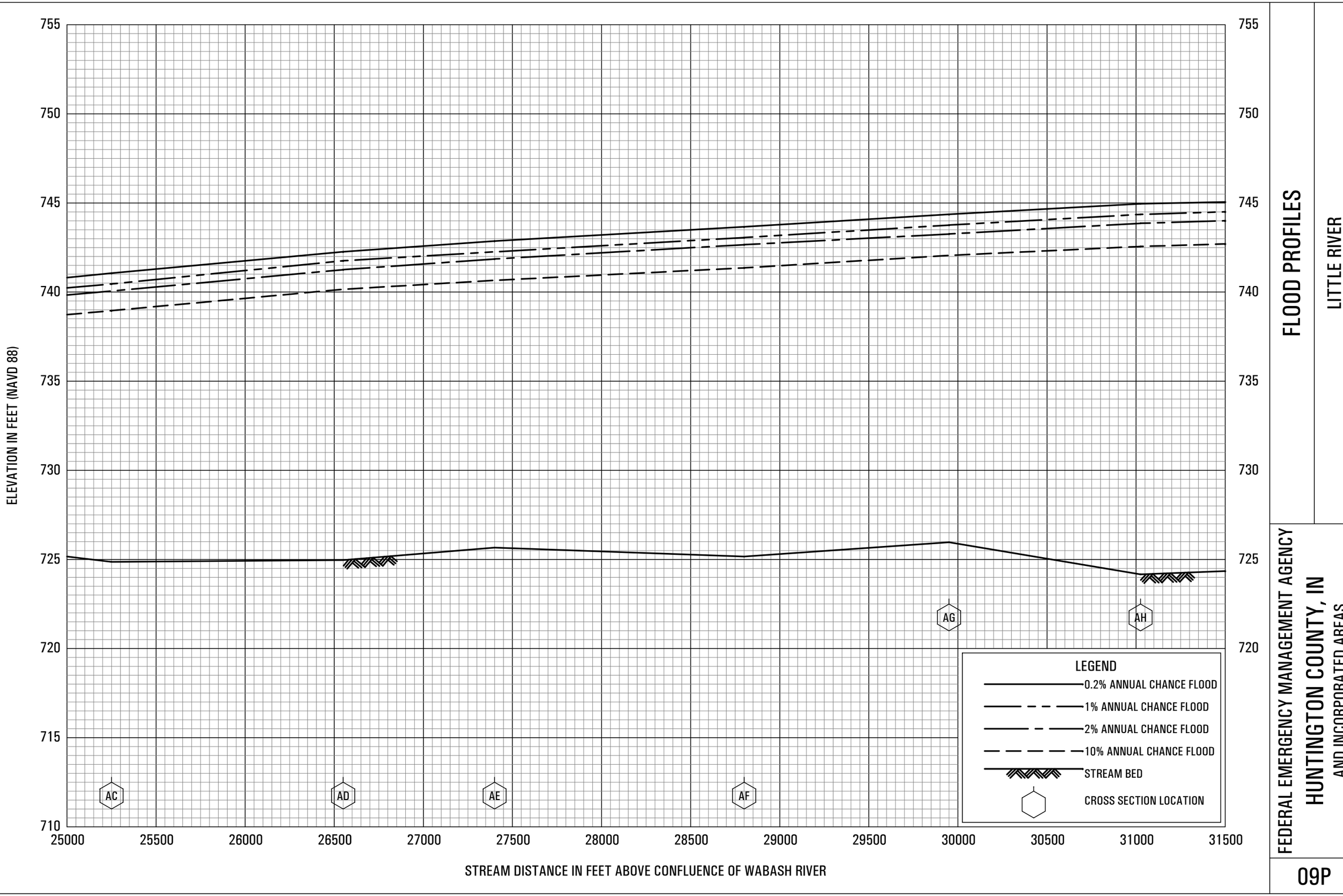
FLOOD PROFILES

LITTLE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

HUNTINGTON COUNTY, IN

AND INCORPORATED AREAS



FLOOD PROFILES

LITTLE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

HUNTINGTON COUNTY, IN

AND INCORPORATED AREAS

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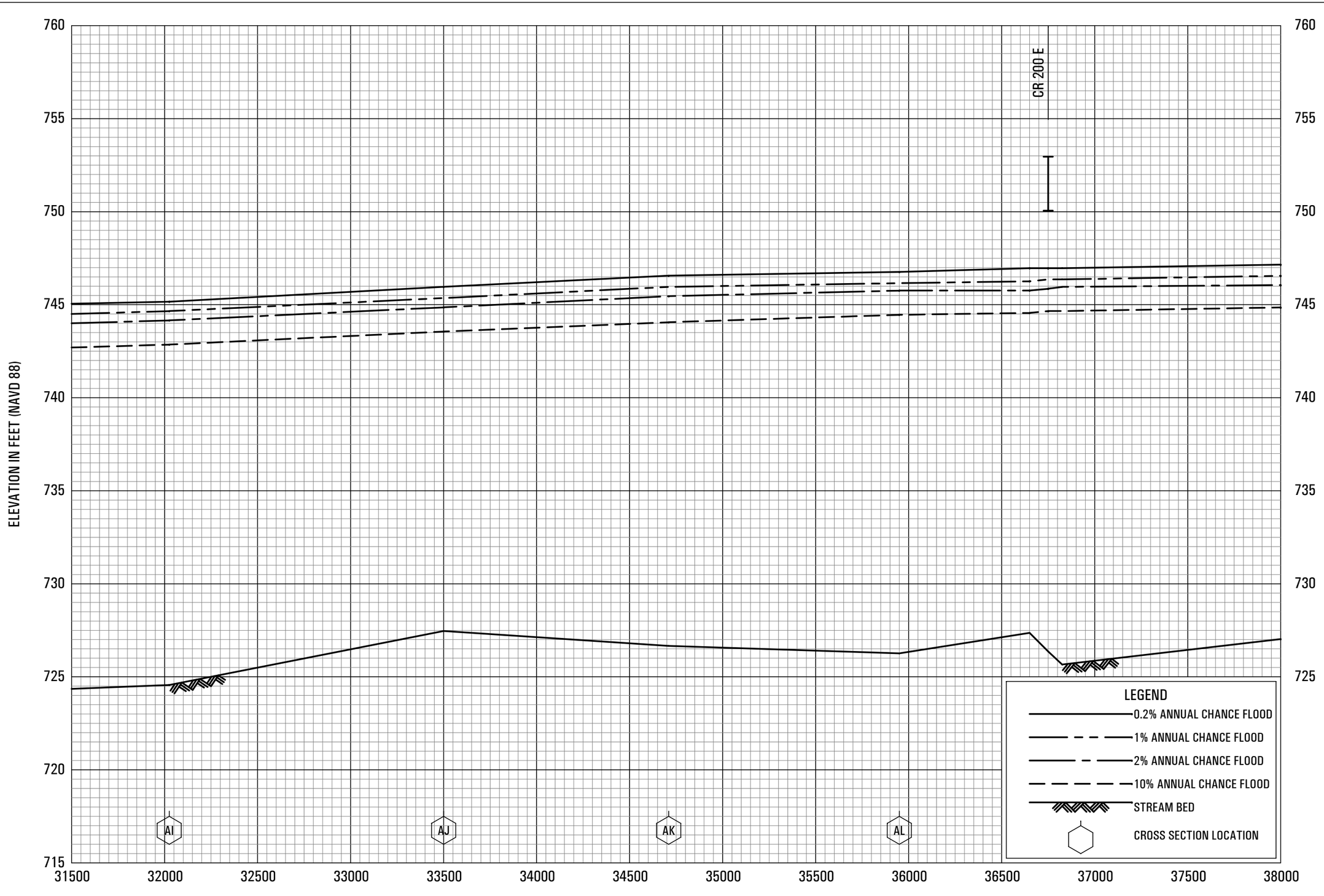

FLOOD PROFILES

LITTLE RIVER

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HUNTINGTON COUNTY, IN

AND INCORPORATED AREAS

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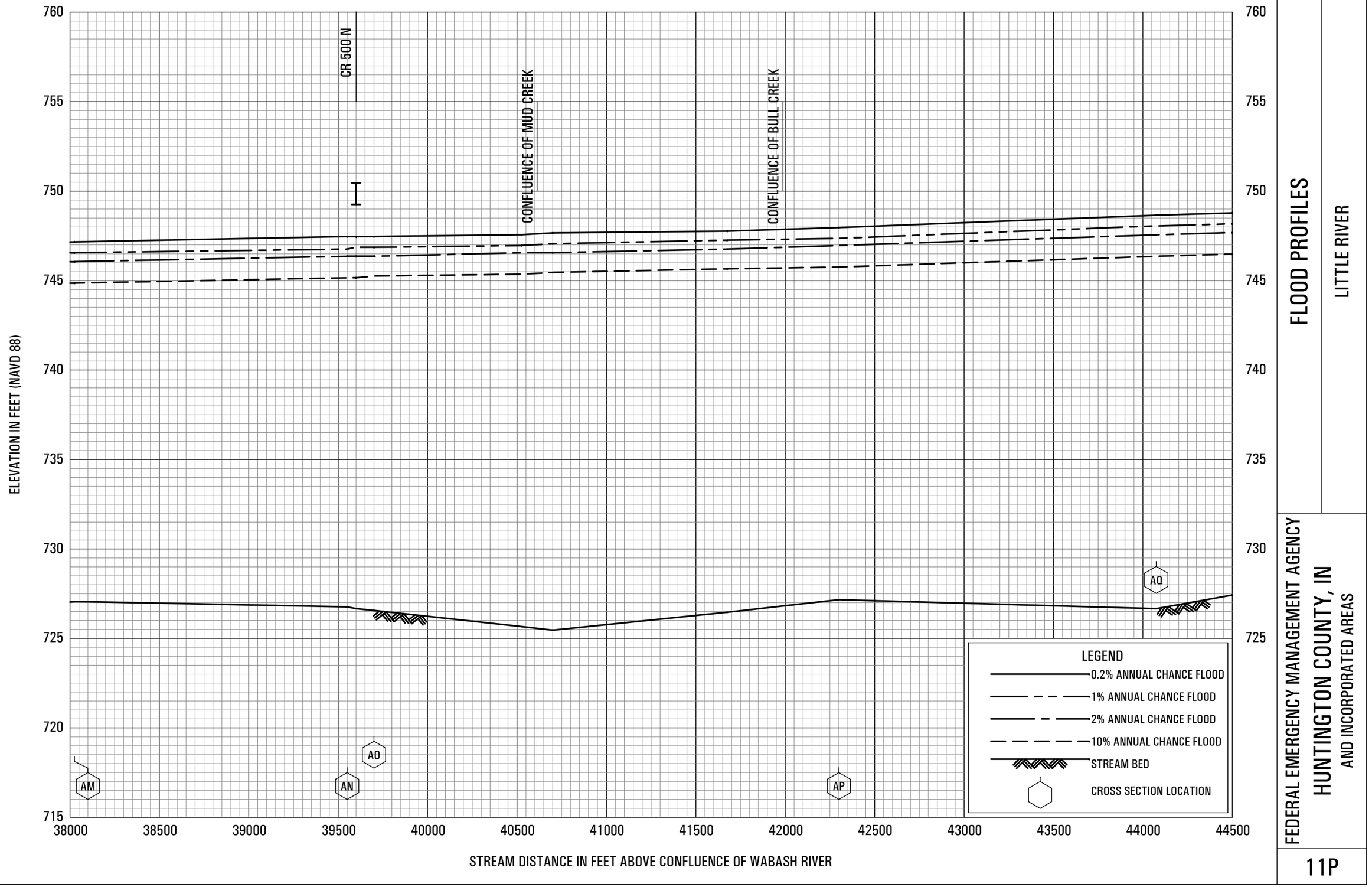


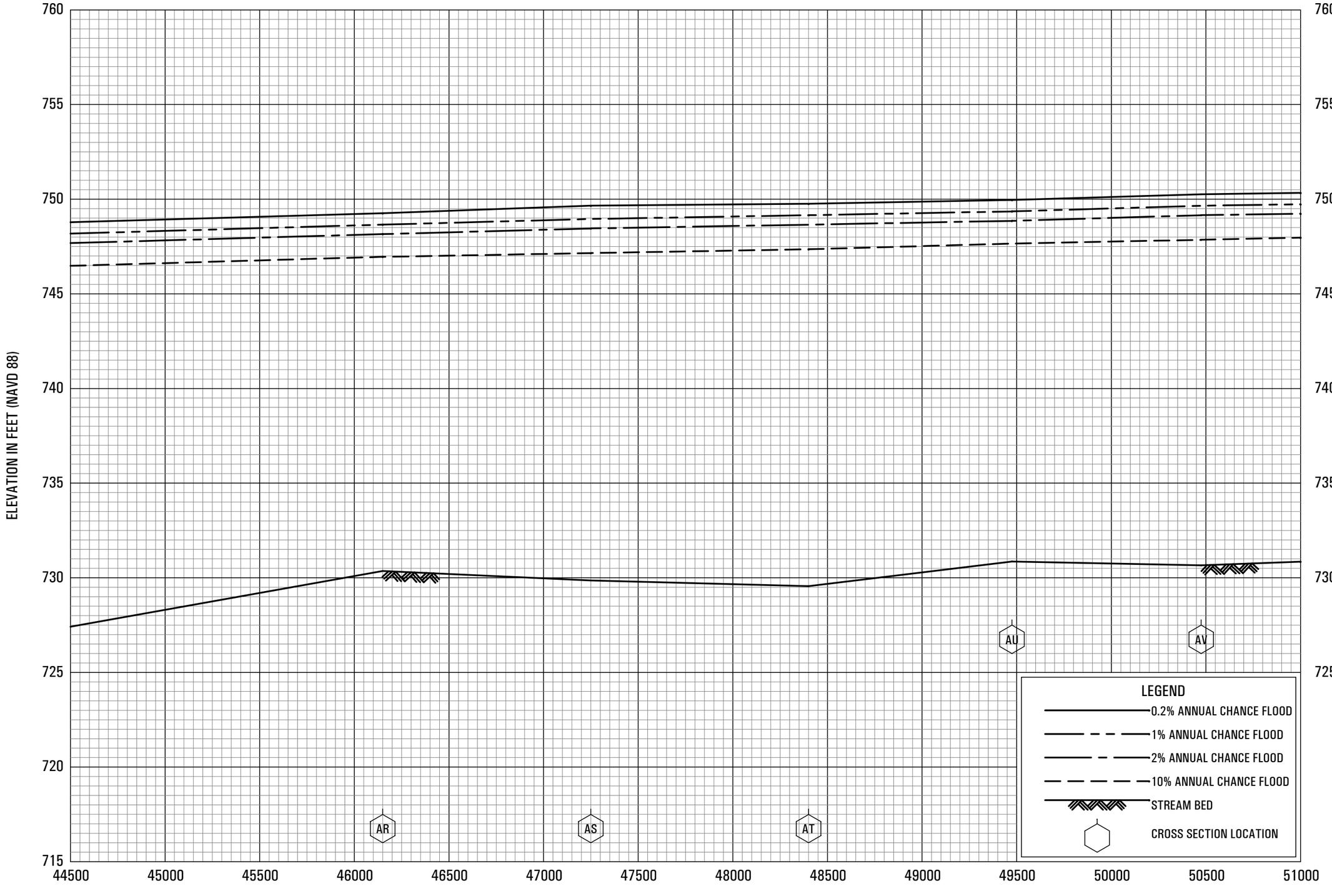
FLOOD PROFILES

LITTLE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

HUNTINGTON COUNTY, IN

AND INCORPORATED AREAS



FLOOD PROFILES

LITTLE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

HUNTINGTON COUNTY, IN

AND INCORPORATED AREAS

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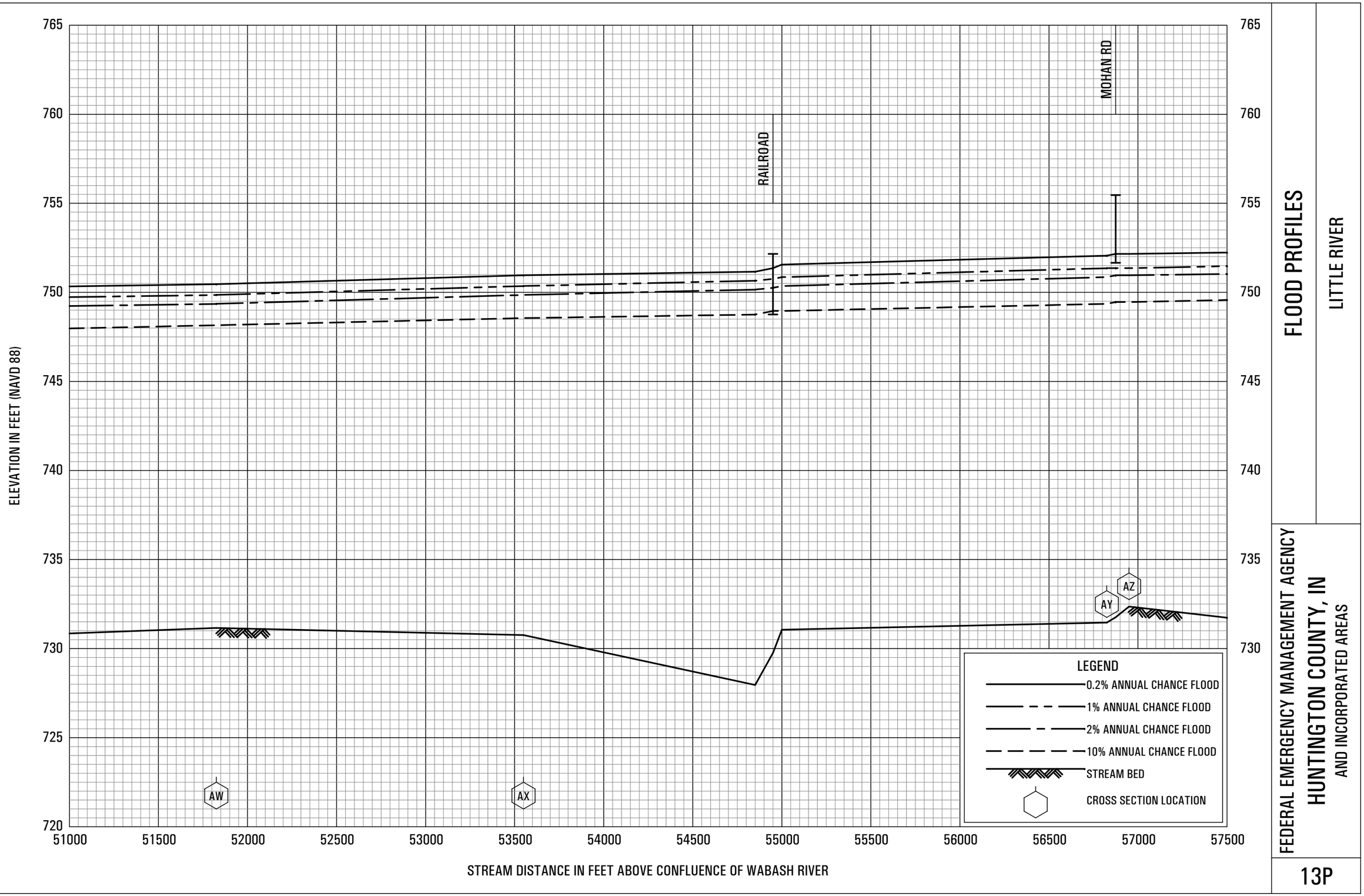

FLOOD PROFILES

LITTLE RIVER

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HUNTINGTON COUNTY, IN

AND INCORPORATED AREAS

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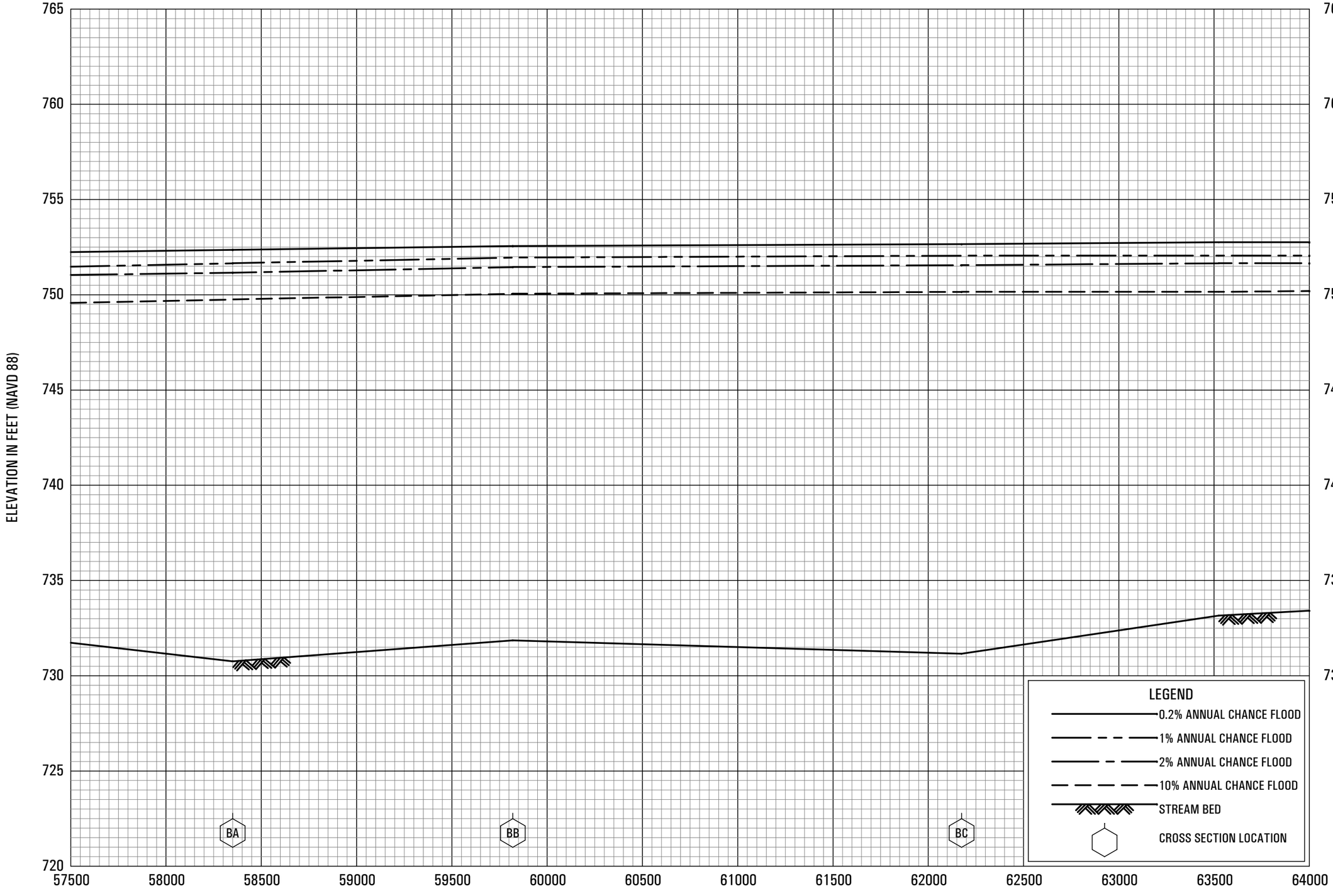

FLOOD PROFILES

LITTLE RIVER

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HUNTINGTON COUNTY, IN

AND INCORPORATED AREAS

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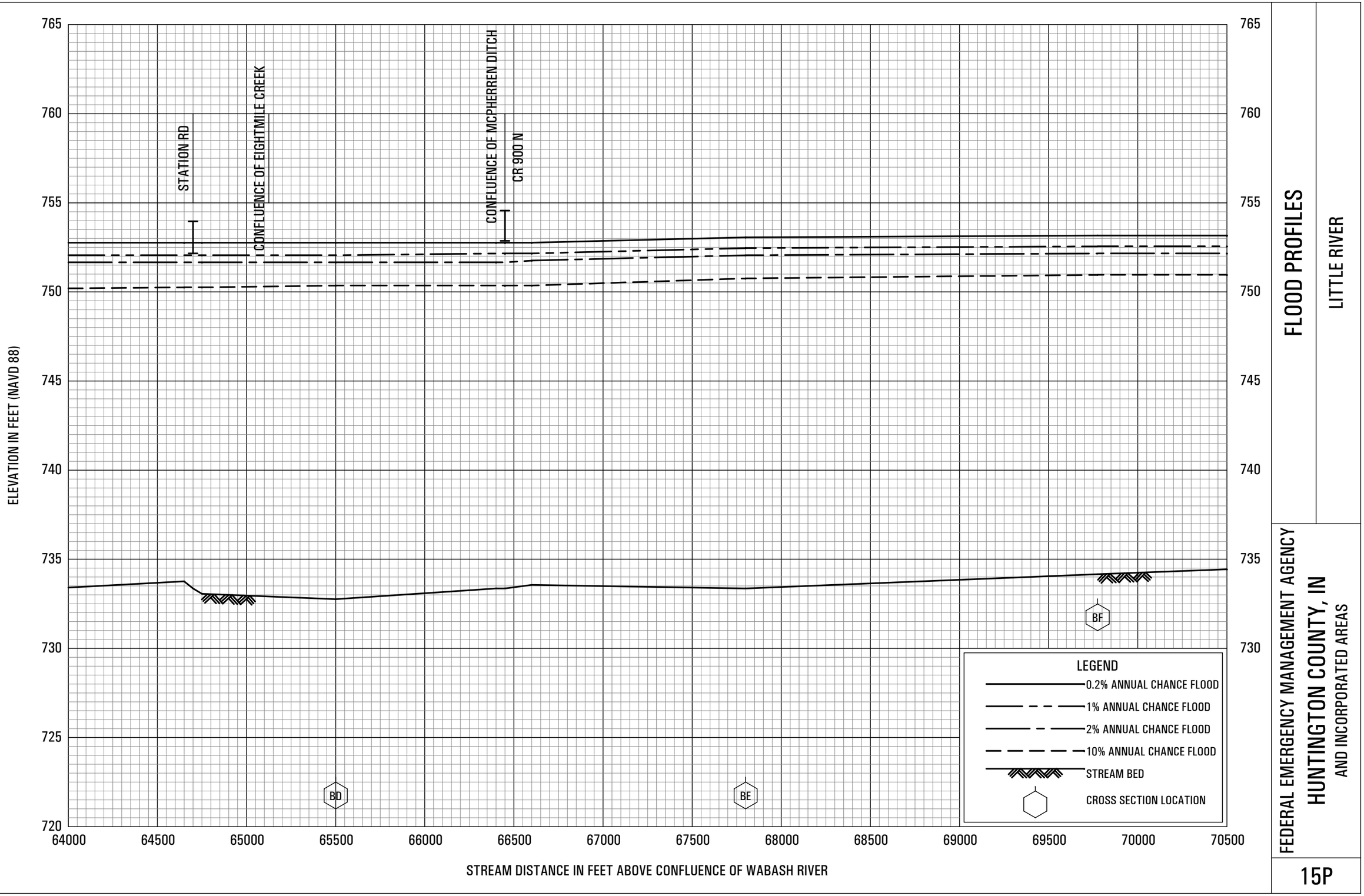

FLOOD PROFILES

LITTLE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

HUNTINGTON COUNTY, IN

AND INCORPORATED AREAS

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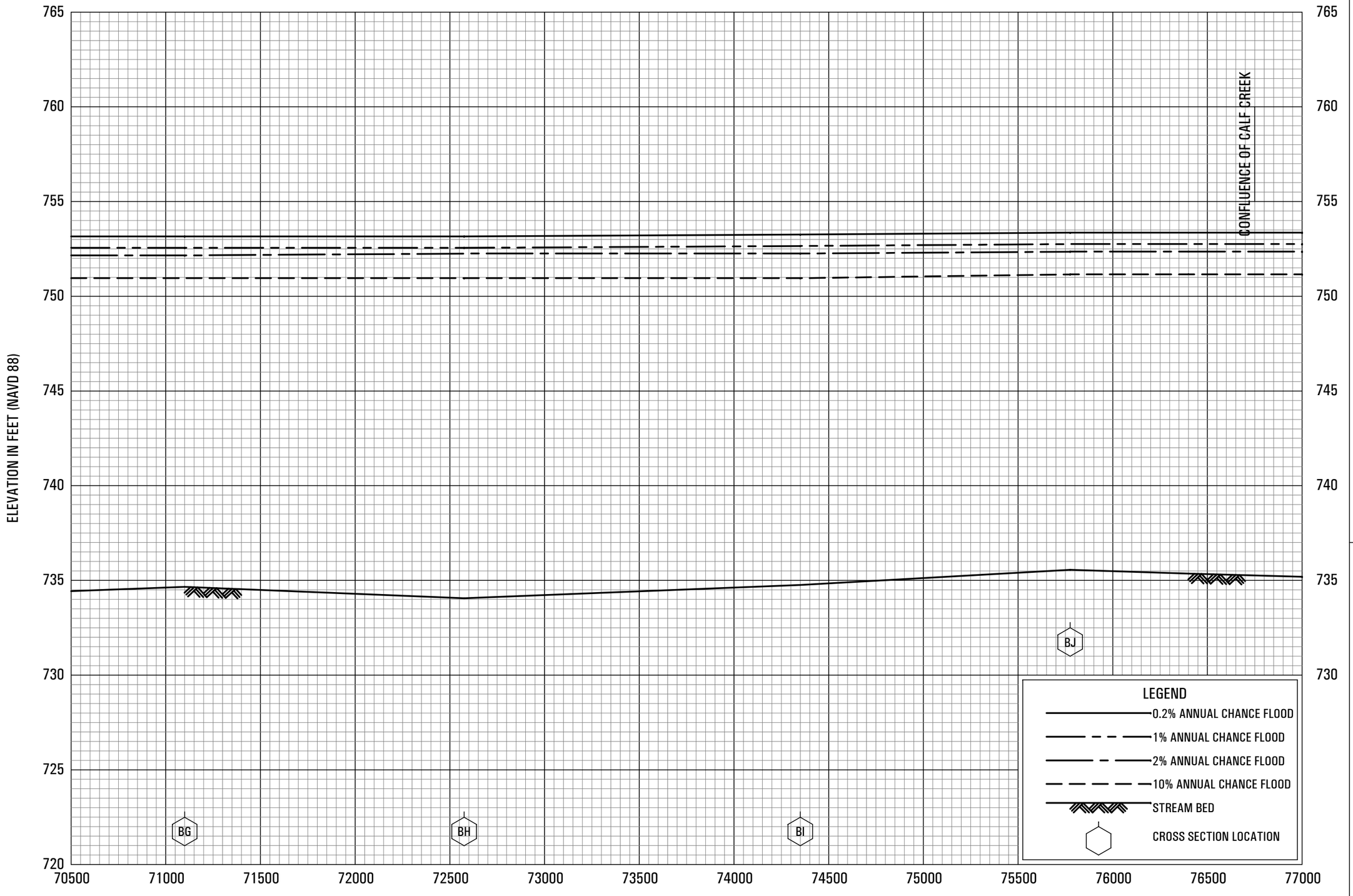

FLOOD PROFILES

LITTLE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

HUNTINGTON COUNTY, IN

AND INCORPORATED AREAS

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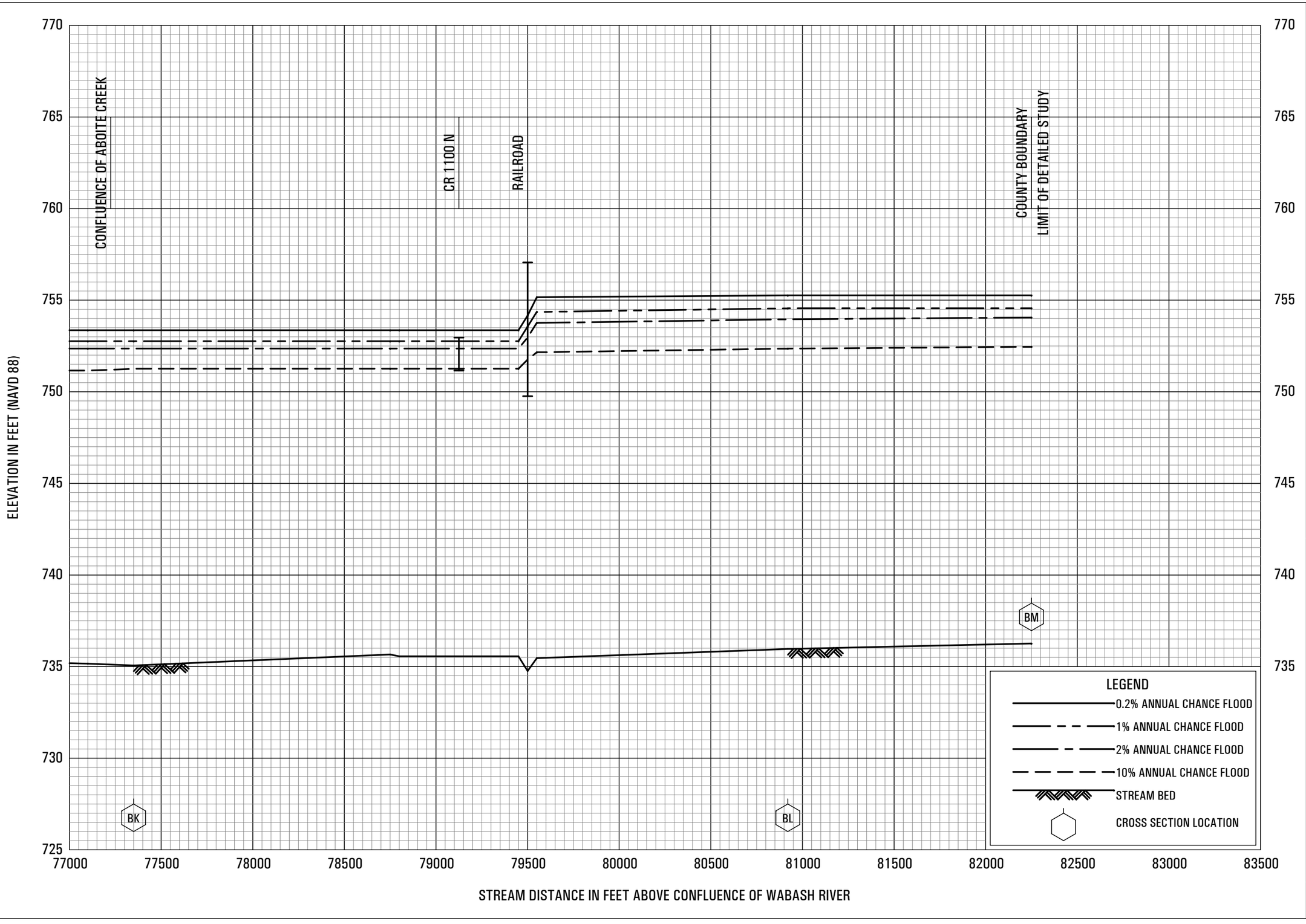

FLOOD PROFILES

LITTLE RIVER

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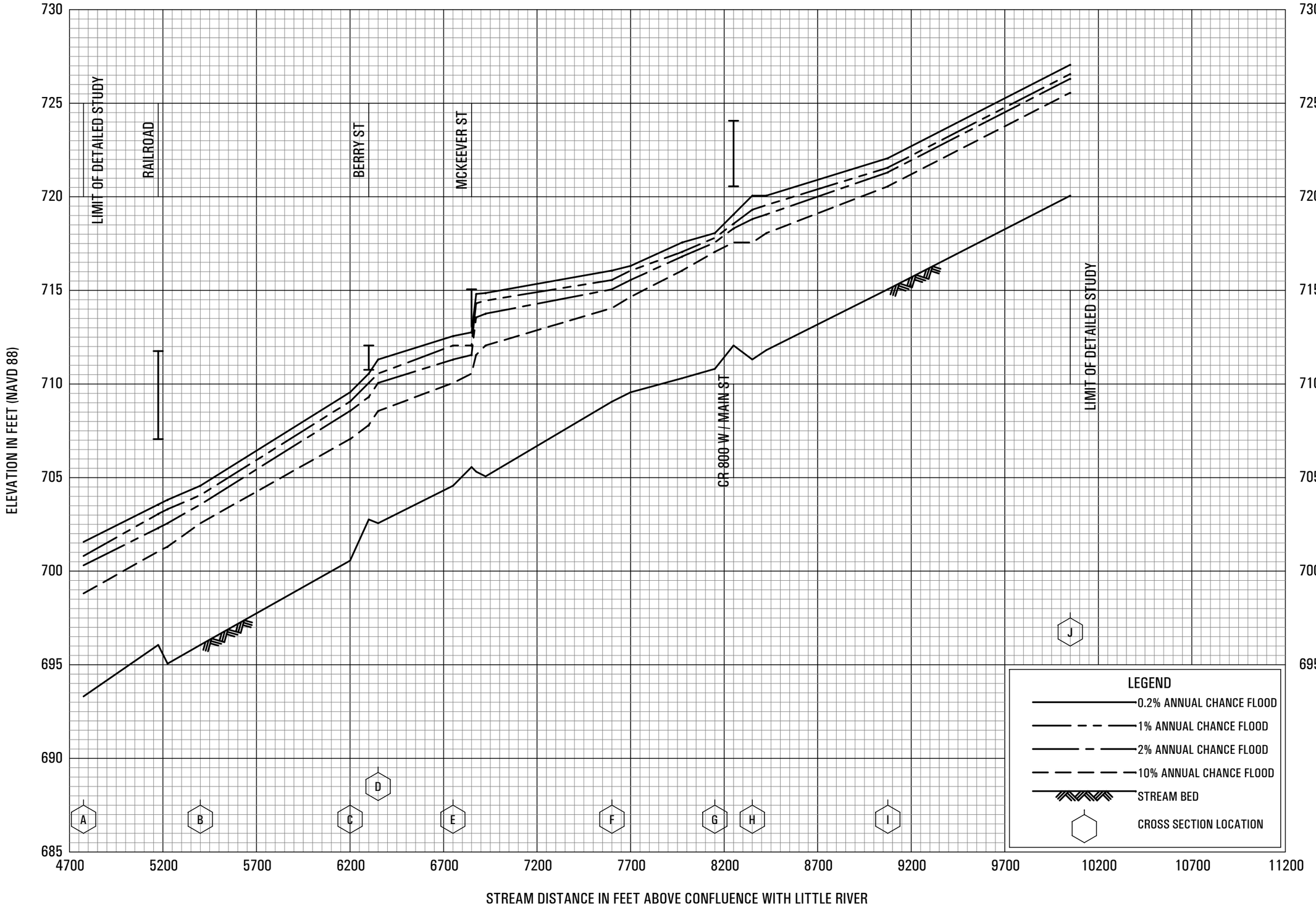
HUNTINGTON COUNTY, IN

AND INCORPORATED AREAS



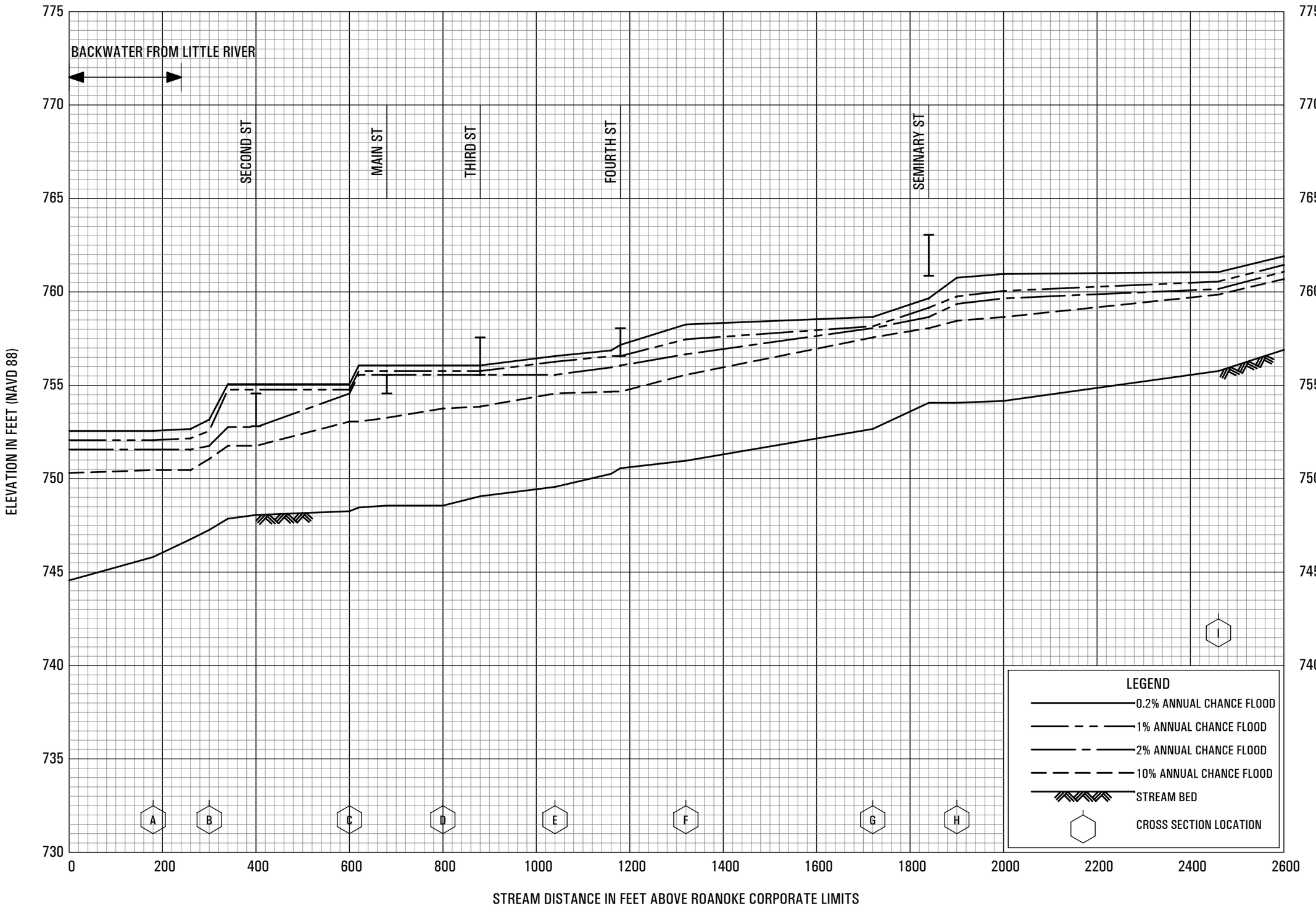
FLOOD PROFILES

LOON CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

HUNTINGTON COUNTY, IN

AND INCORPORATED AREAS



FLOOD PROFILES

MCPHERREN DITCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

HUNTINGTON COUNTY, IN

AND INCORPORATED AREAS

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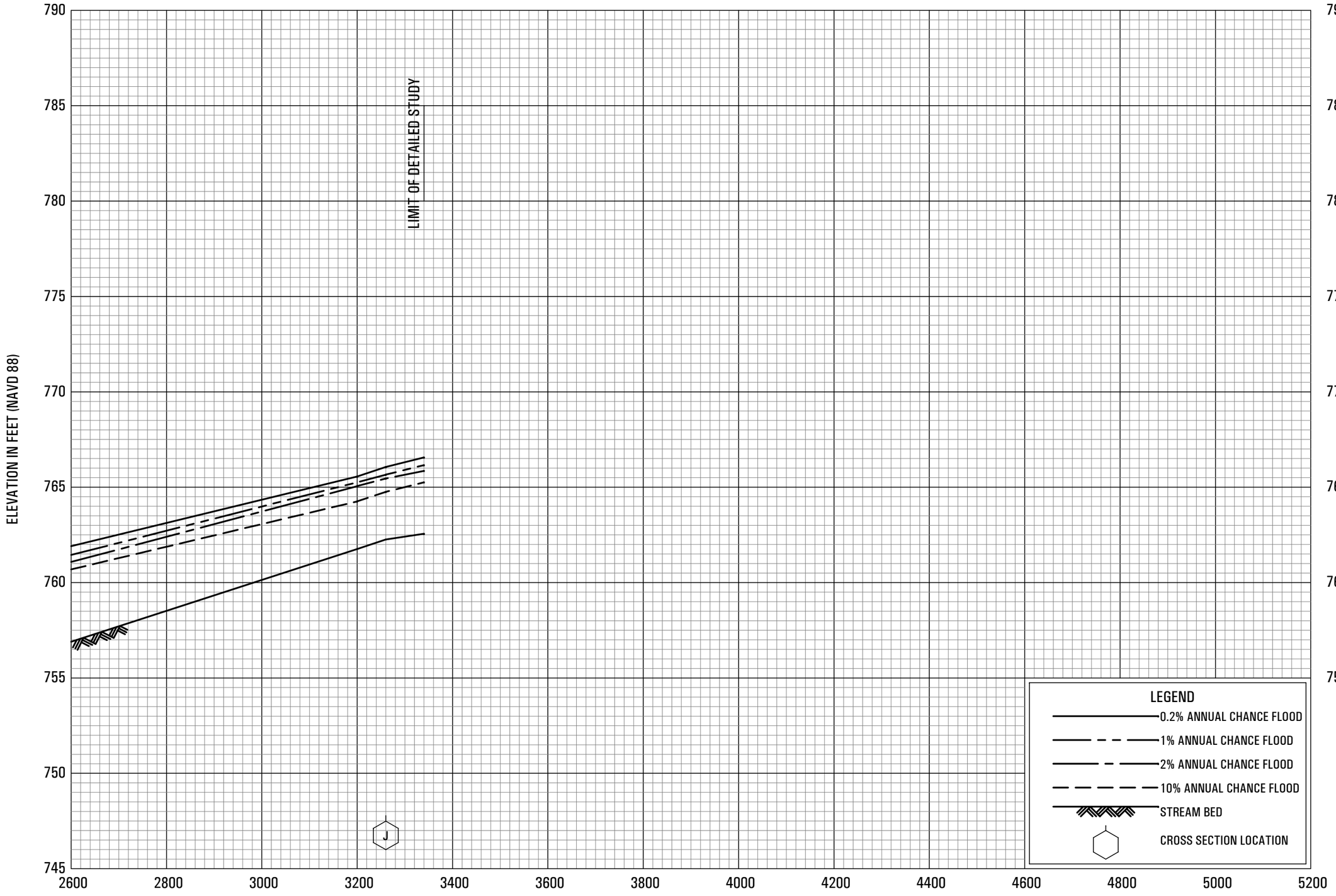


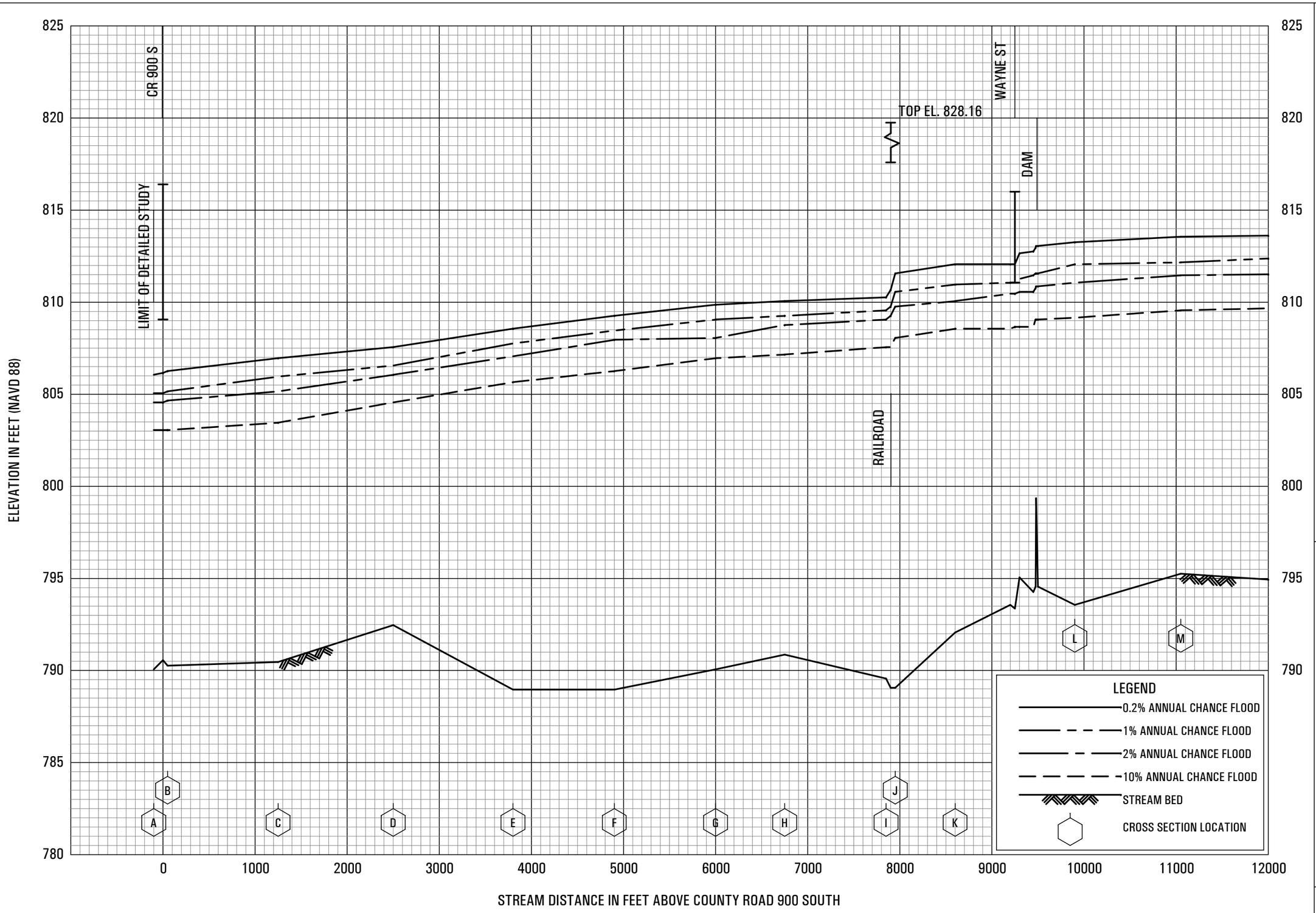
FLOOD PROFILES

MCPHERREN DITCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

HUNTINGTON COUNTY, IN

AND INCORPORATED AREAS



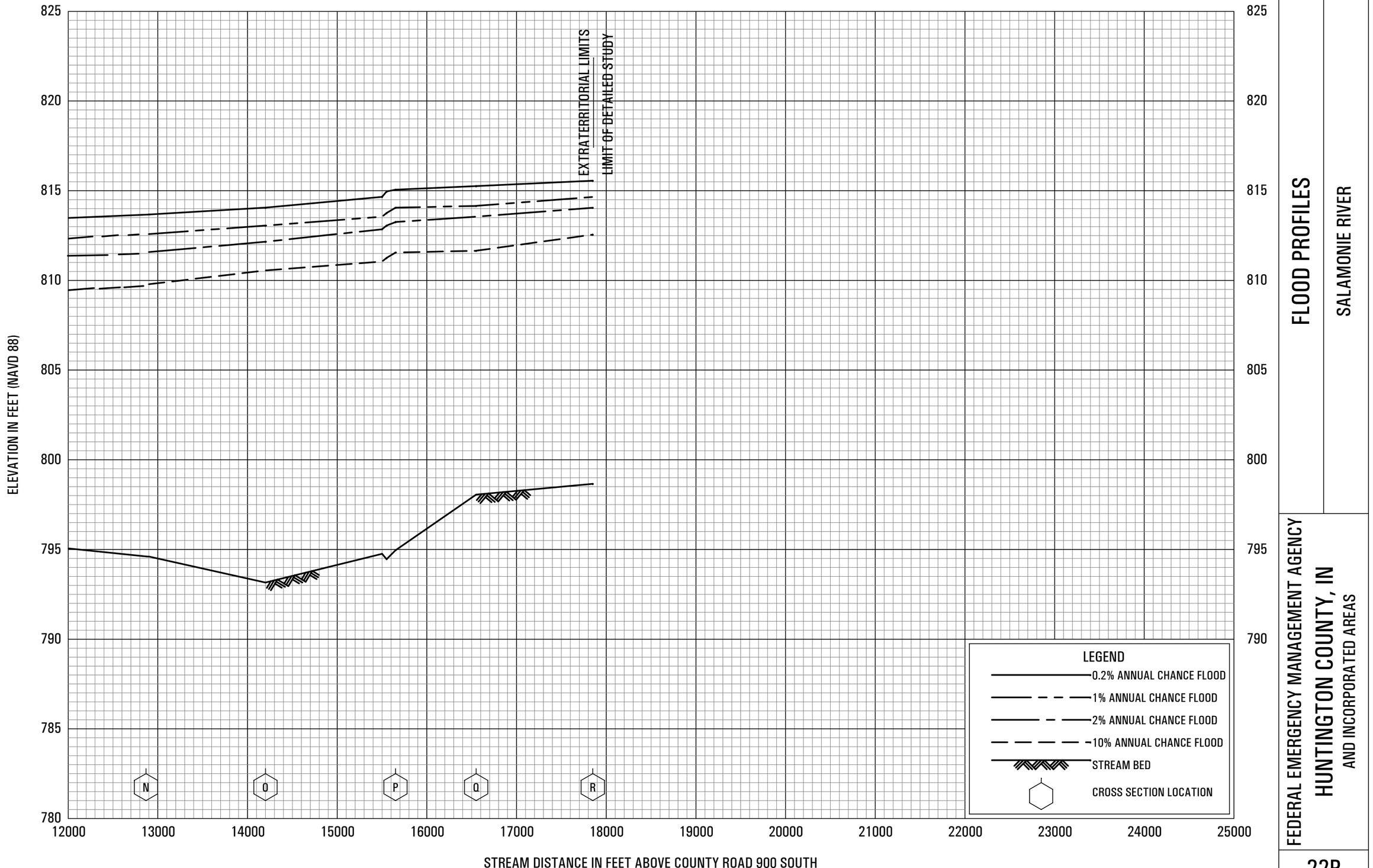
FLOOD PROFILES

SALAMONIE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

HUNTINGTON COUNTY, IN

AND INCORPORATED AREAS



FLOOD PROFILES

SALAMONIE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

HUNTINGTON COUNTY, IN

AND INCORPORATED AREAS

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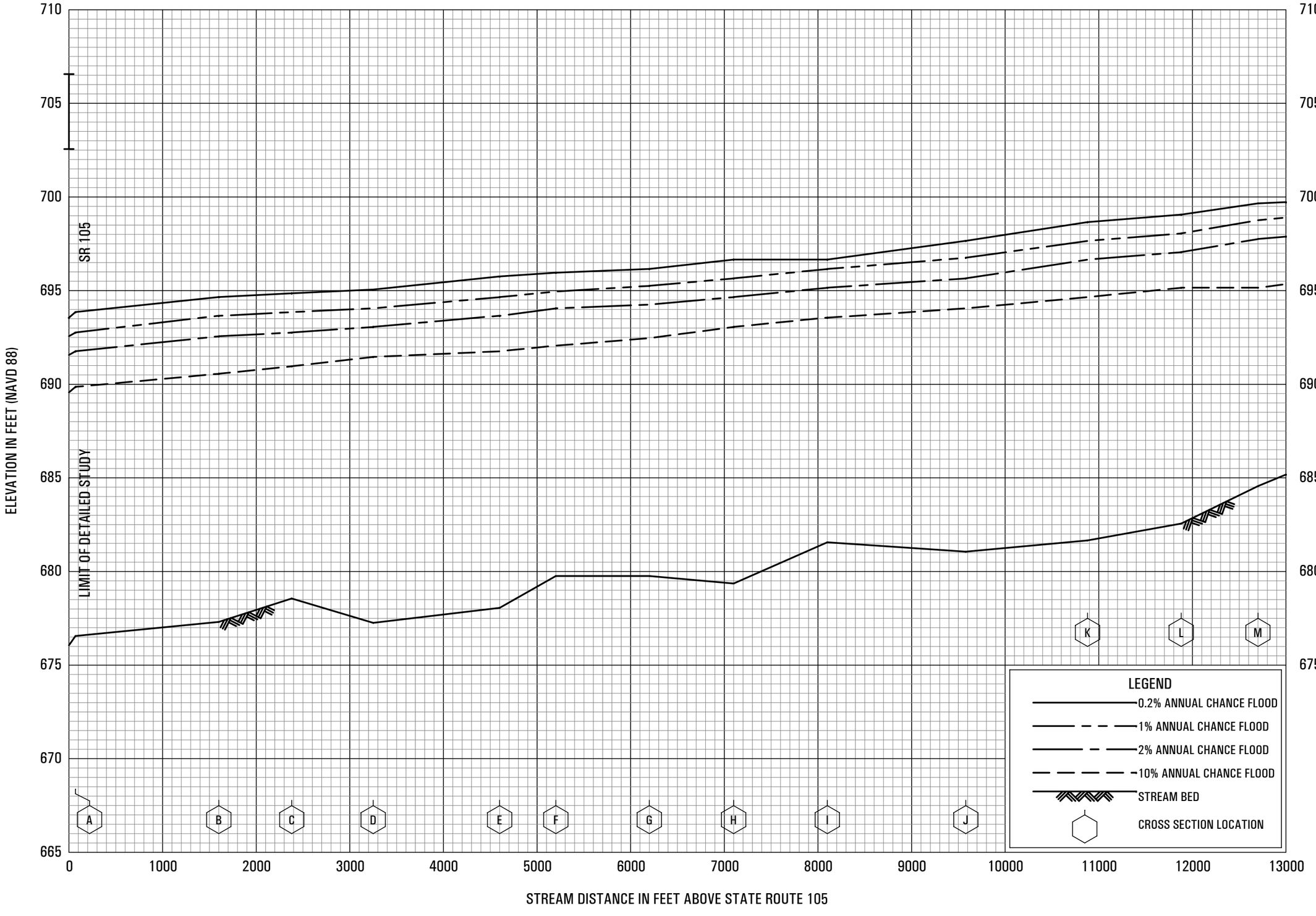

FLOOD PROFILES

WABASH RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

HUNTINGTON COUNTY, IN

AND INCORPORATED AREAS

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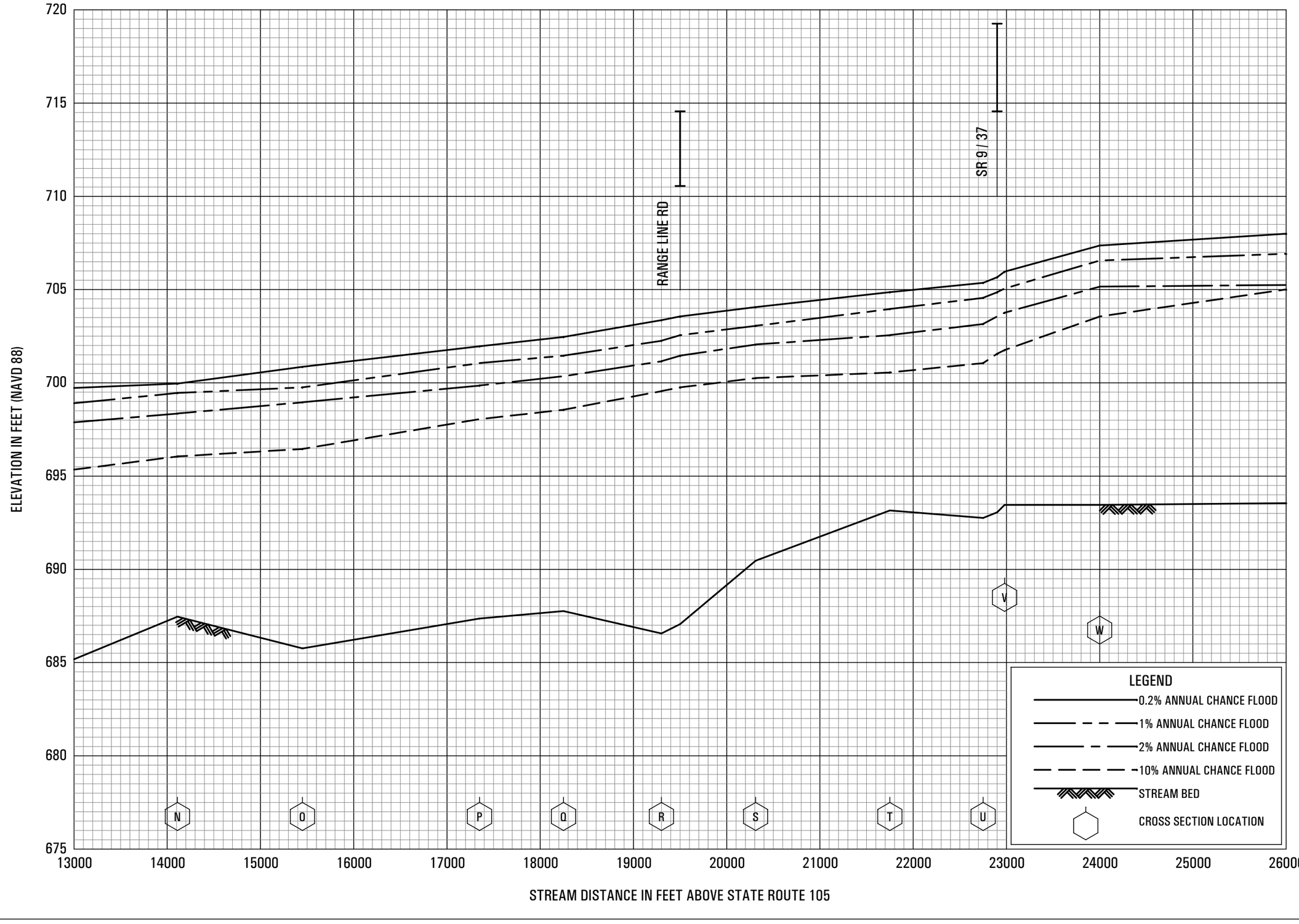


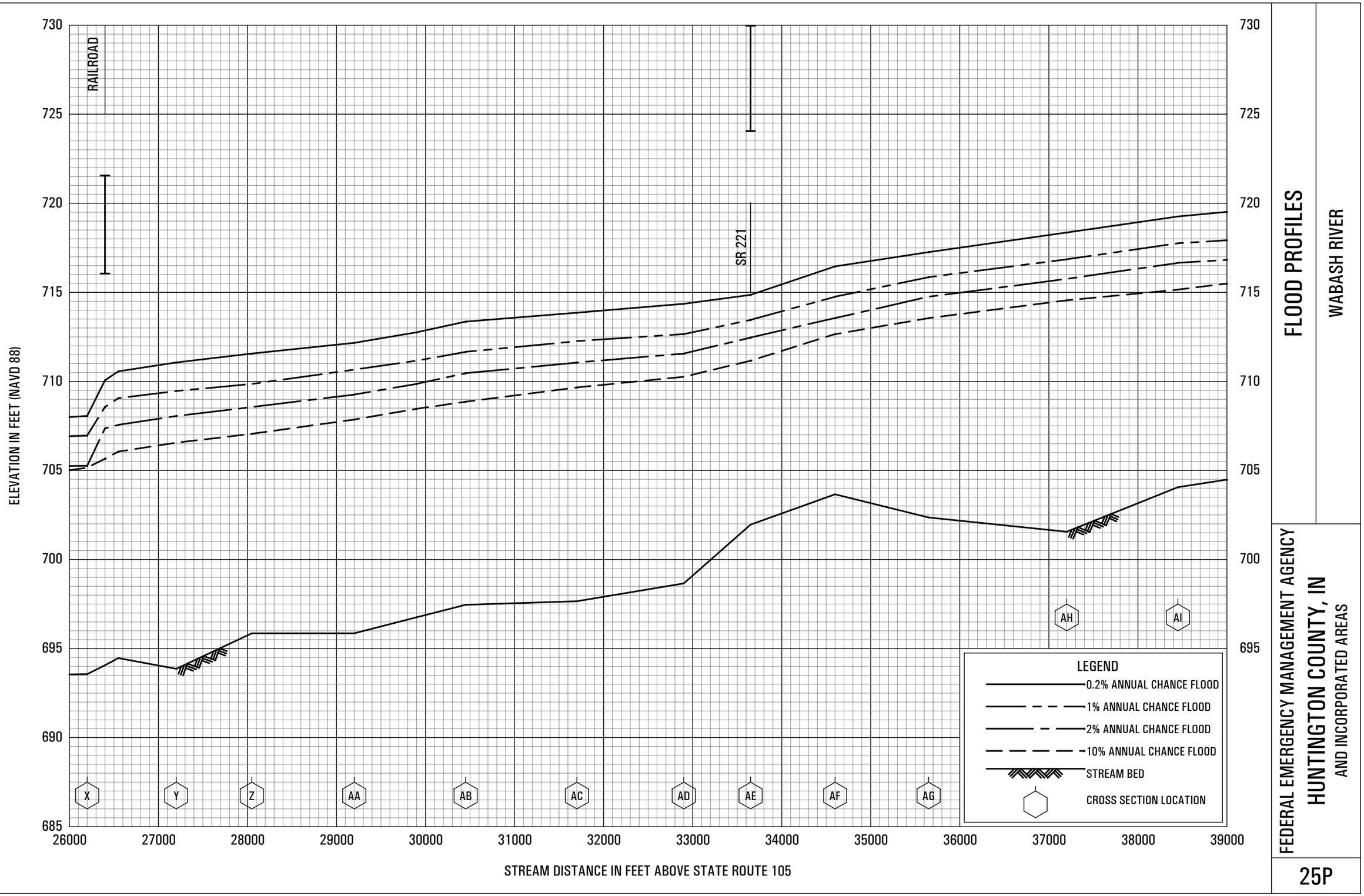
FLOOD PROFILES

WABASH RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

HUNTINGTON COUNTY, IN

AND INCORPORATED AREAS



FLOOD PROFILES

WABASH RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

HUNTINGTON COUNTY, IN

AND INCORPORATED AREAS

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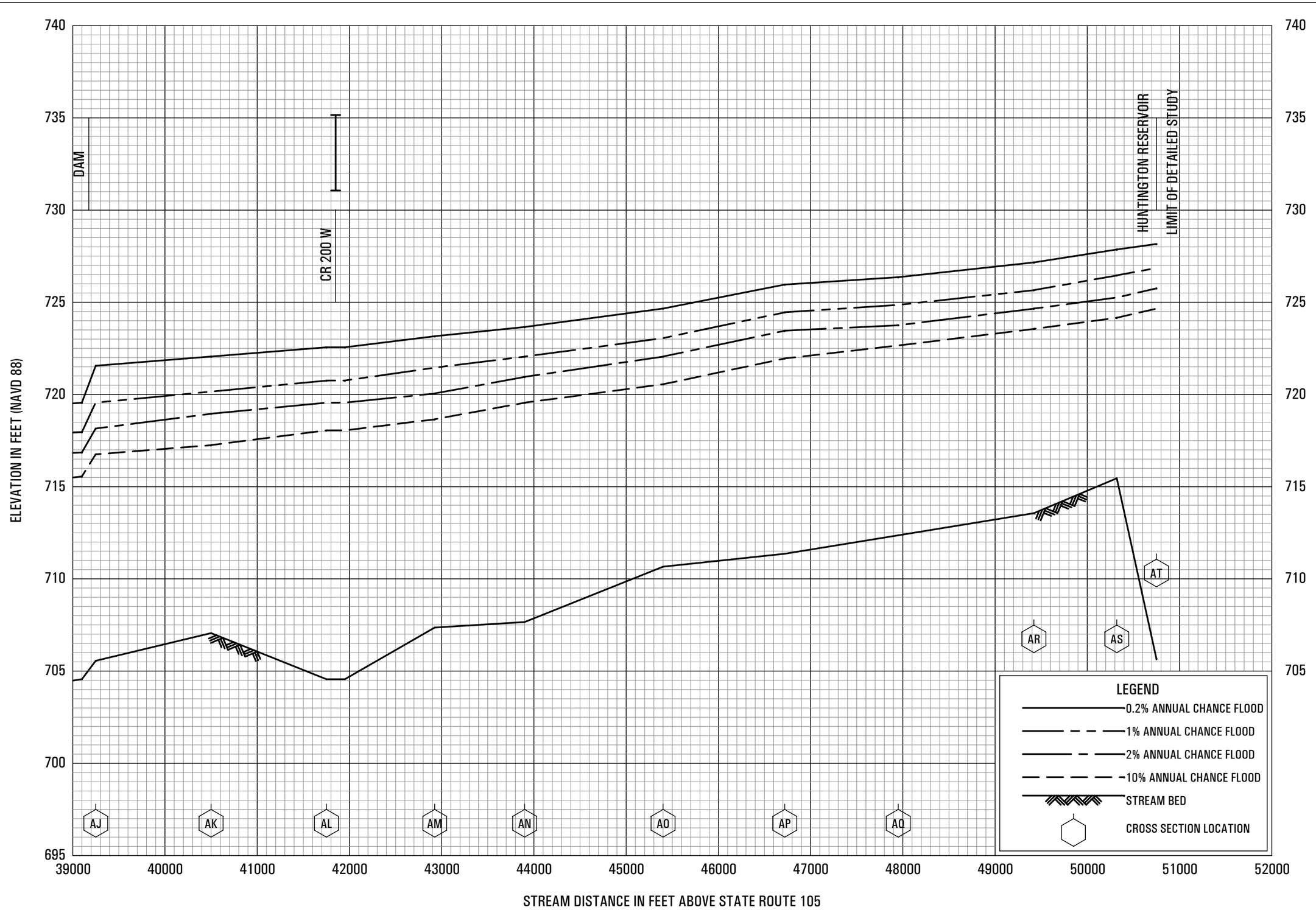

FLOOD PROFILES

WABASH RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

HUNTINGTON COUNTY, IN

AND INCORPORATED AREAS

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